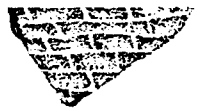
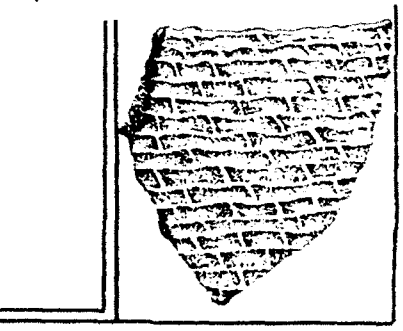


ARCHAEOLOGICAL INVESTIGATIONS OF THE LITTLE CYPRESS BAYOU SITE (3CT50) CRITTENDEN COUNTY ARK.

By
A. Merrill Dicks
Carol S. Weed

VOLUME I

Prepared under
Contract No. DACW66-82-R-0064
U.S. Army, Corps of Engineers
Memphis District



New World Research, Inc.
Report of Investigations No. 82-21
-1986-

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	1986	Final

4. TITLE AND SUBTITLE
Archaeological Investigations of the Little Cypress Bayou Site (3CT50) Crittenden Co.,AR
2 volumes

5. FUNDING NUMBERS
c DACW66-82-R-0064

6. AUTHOR(S)
A. Merrill Dicks
Carol S. Weed

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
New World Research ,Inc.

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Dept. of the Army
Memphis District Corps of Engineers
B-202 Clifford Davis Federal Bldg.
Memphis, TN 38103

10. SPONSORING / MONITORING AGENCY REPORT NUMBER
174

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION / AVAILABILITY STATEMENT
Unlimited

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

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14. SUBJECT TERMS			15. NUMBER OF PAGES
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT

(174)

ARCHAEOLOGICAL INVESTIGATIONS

OF

THE LITTLE CYPRESS BAYOU SITE (3CT50)

CRITTENDEN COUNTY, ARKANSAS

-Volume I-

By

A. Merrill Dicks
Carol S. Weed
L. Janice Campbell

Prepared Under the Supervision of

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Principal Investigator

Prepared For

U.S. Army, Corps of Engineers
Memphis District

Under Contract No. DACW66-82-R-0064

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ABSTRACT

From late fall 1981 into the spring of 1982, New World Research, Inc. conducted a program of testing and data recovery at 3CT50, the Little Cypress Bayou site, in Crittenden County, Arkansas. The project was funded and administered by the U.S. Army Corps of Engineers, Memphis District, under Contract No. DACW66-82-R-0064. During the course of investigations, various stages of work were conducted including: 1) controlled surface collections; 2) site contour mapping; 3) preliminary test excavations; 4) data recovery block excavations; and 5) data analyses. Although the work was confined to a proposed bridge right-of-way, valuable data pertinent to Baytown period and Mississippian stage occupations were collected. In sum, feature categories, eight structures and 10 feature clusters, in addition to midden deposits were defined at the site.

ACKNOWLEDGMENTS

A project of the complexity and duration of the archaeological investigations at the Little Cypress Bayou site (3CT50) involved the talents and expertise of numerous individuals. The authors wish to take this opportunity to thank them and, where appropriate, agencies for their participation in the project.

The U. S. Army Corps of Engineers, Memphis District funded the excavations and subsequent analyses under Contract Number DACW66-82-R-0064. The Contracting Officer's Representative, Mr. Doug Prescott, has served in that position for the duration of the project and has demonstrated understanding and patience through the innumerable personnel changes and delays. Additionally, Mr. James McNeil, also of the Corps, answered logistical questions during the two phases of field work.

Miss Hester Davis and Dr. Dan Morse of the Arkansas Archeological Survey supplied valuable insights into previous investigations at the site and in the region.

During the course of the project, the co-principal investigators, Dr. Prentice M. Thomas and Dr. Jeffrey Altschul actively participated in various aspects. Thomas supervised the initial Phase I collections, while Altschul oversaw the Phase II fieldwork and began the initial synthesis of data. Altschul was unable to see the project to completion, and since his departure in 1983 Thomas has overseen the finalization of various report sections and analyses.

The fieldwork associated with Phases I and II of the project was completed over the course of the winter of 1982/1983. Little positive

can be said concerning the weather that year, and the field crews who somehow managed to cope with unbelievably muddy conditions must be gratefully acknowledged. Particular thanks are extended to the crew chiefs (Robert Martin, Brian Morris and David Zeanah) and the field laboratory director (Barbara A. Ribling). The remaining crew members included: Billie Barton, Lance and Paul Blevins, Joseph Brent, Maria Campbell Brent, George Brown, Sherry Brown (who also served as cook), Wade Carr, Julia Clifton, Bobby Green, Keith Hemphill, Jeffrey Homburg, Jeffrey Jones, Andy Ketterer, Robert Lauderdale, Michael Lewis, Jessie Mitchell, Julia Ray, Richard Sims, Pamela Stovall (who also served as site photographer), and Bobby Winningham.

The project consultants included: Dr. Arthur E. Bogan (Academy of Natural Sciences of Philadelphia, Zooarchaeology); Glen Fredlund and Steven Bozarth (University of Kansas, Palynology); Dr. Herbert Haas (Southern Methodist University, Radiocarbon Laboratory); Dr. William Johnson (University of Kansas, Geomorphology); John P. Lenzer (Geomorphology); Dr. Jerome C. Rose, Murray K. Marks and Larry L. Tieszen (University of Arkansas, Bioarchaeology); Andrea Shea (Ethnobotany); Dr. Irene Stehle (Dicarb Radioisotope); and Dr. Daniel Wolfman (University of Arkansas, Archeomagnetic). Their respective reports are presented as appendices to the main volume.

Finally, several individuals within the NWR organization were at various times involved with aspects of the project. While it is somewhat unusual to thank those that one works with on a daily basis, the authors wish to depart from norm and say that without the patience and care taken by the NWR staff absolutely none of the report would have been completed. Therefore, our special thanks to Renee Morrison (who typed); Robert Corley and Susan Keuer-Jones (who drafted); and Vicky Hudnell (who copied). And, finally but not least, Joyce Barnhill, the accounts manager, who retained her sense of calm even under the most adverse monetary snafus and who, in the waning days of December saw the project to completion.

AMD
CSW
LJC
December, 1985

CHAPTER ONE

INTRODUCTION

Under Contract Number DACW66-82-R-0064 with the Memphis District U. S. Army Corps of Engineers (Corps), New World Research, Inc. (NWR) conducted a program of intensive archaeological testing at the Little Cypress Bayou site (3CT50), located in north-central Crittenden County, Arkansas (Figure 1). This testing was followed by an extensive data recovery program directed toward mitigating the impact on cultural remains of bridge construction associated with excavation of the nearby Big Creek stream channel. Mitigation was achieved primarily by the documentation, excavation and removal of cultural resources from within the proposed bridge construction right-of-way (ROW).

Field work at the Little Cypress Bayou site was conducted in two phases, separated from one another by a two month interim period during which the results of the first phase were assessed. Phase I field work began in October 1982 and was concluded in late December of the same year. This phase involved testing of the site area in order to develop an appropriate mitigation and excavation plan. Phase II, which began in early March 1983, and ended in early May, consisted of intensive excavation of the area of the site specifically scheduled for destruction by the Big Creek bridge construction. During the interim period between Phases I and II, a small crew was kept on the site to guard exposed cultural remains against vandalism, and to carry out certain tasks in anticipation of the initiation of a full scale recovery program. Phase II was followed by Phase III, a lengthy period of analysis, further research and the preparation of this report.

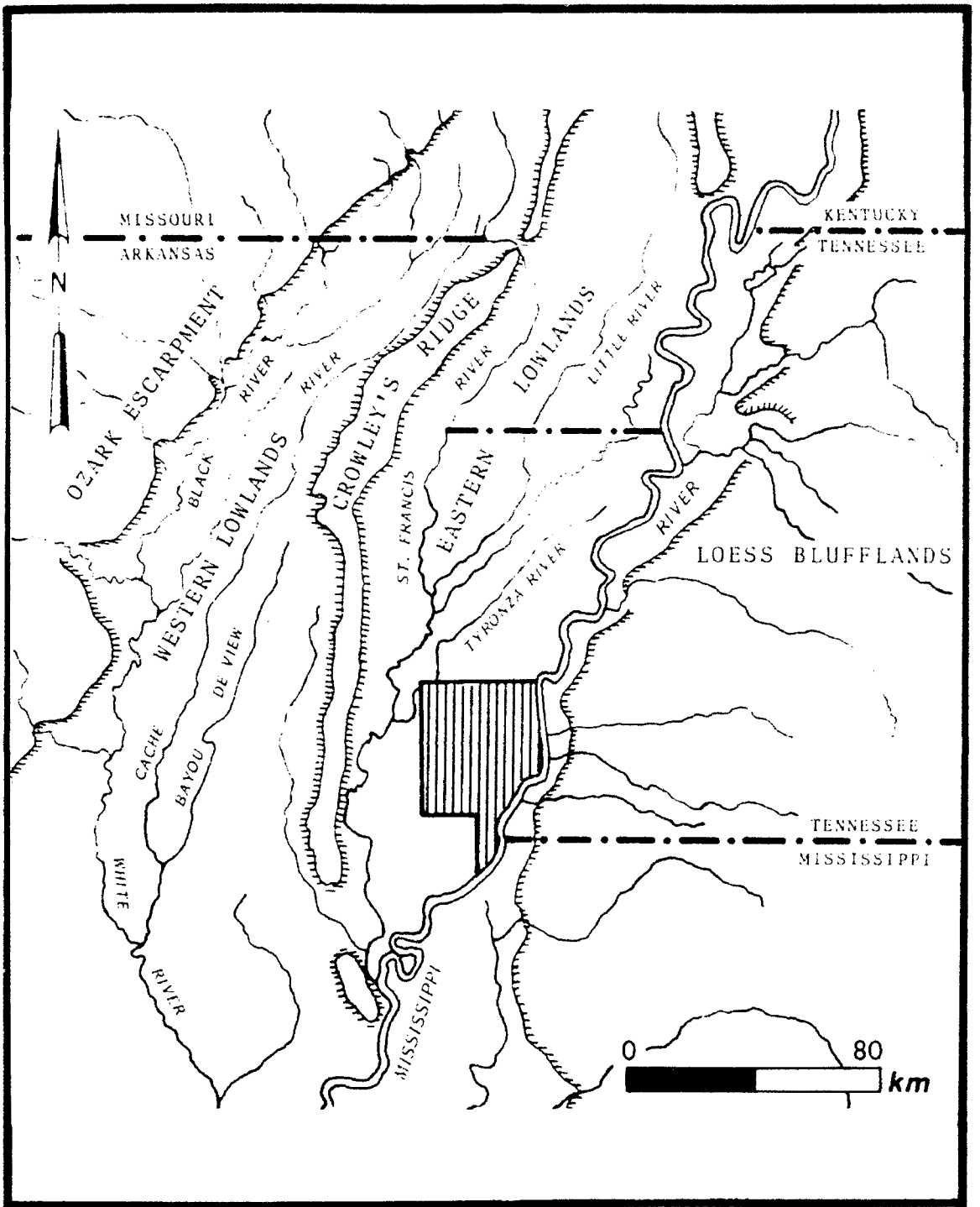

FIGURE 1. LOCATION OF THE BIG CREEK, ITEM 2 PROJECT AREA AND CRITTENDEN COUNTY, ARKANSAS IN THE CENTRAL MISSISSIPPI VALLEY. Note: the hatchured area is Crittenden County.

Description of the Project Area

The Little Cypress Bayou site is located in the Eastern Lowlands of Arkansas. This area of Arkansas is included within the Central Mississippi Alluvial Valley which forms a part of the Gulf Coastal Plains physiographic province (Fenneman 1938).

The Eastern Lowlands are bordered to the west by Crowley's Ridge, an erosional upland remnant, and to the east by the Mississippi River and the adjacent western Tennessee and Mississippi blufflands region (see Figure 1). Prior to the initiation of extensive drainage projects in the first half of this century the portion of Crittenden County in which the site is located was characterized by swamps and extensive, poorly drained interfluvial areas. These wet areas were periodically interrupted by natural levees and ridges that bordered both active and abandoned stream channels.

The region comprises the present day meander belt of the Mississippi River. The Eastern Lowlands here are approximately 55 km wide and vary less than 10 m to 15 m in elevation across its surface. Crowley's Ridge, as noted forming the western border, rises almost 80 m above the adjacent lowland terrain.

Several major rivers flow through this region, and generally drain north to south. The most conspicuous of these is, of course, the Mississippi River, which is located 20 km east of 3CT50. Approximately 20 km west of the site is the St. Francis River, which is joined by another major drainage, the Tyronza River, near Parkin, Arkansas (Figure 2).

Numerous smaller streams and creeks form tributaries that flow into the larger rivers of the Lowlands. One of these is Big Creek, which has its headwaters almost at the Mississippi River; however, Big Creek drains westward, eventually becoming a tributary of the Tyronza and St. Francis rivers. Second order creeks such as Big Creek are fed by small bayous and streams that drain the swampy areas and extensive interfluvial plains between drainages. Site 3CT50 is located near the juncture of one of these, Little Cypress Bayou, with Big Creek, five kilometers northwest of Turrell, Arkansas (Figure 3).

The site occupies a high ridge nose that is formed by a relic levee structure of an abandoned Mississippi River channel (Figure 4). A portion of this channel is presently occupied by Big Creek which drains to the west, 70 m south of the site area. This channel is approximately 15 m wide and three meters lower in elevation than the crest of the relict levee upon which the site is situated (Figure 5).

Little Cypress Bayou joins Big Creek southwest of the immediate site area, occupying a deep, narrow ravine that has downgraded and truncated the otherwise continuous relict levee. This minor tributary of Big Creek, even during the wet season, is less than a meter across, but serves as a drainage for the extensive interfluvial plain located north of the site and behind the levee.

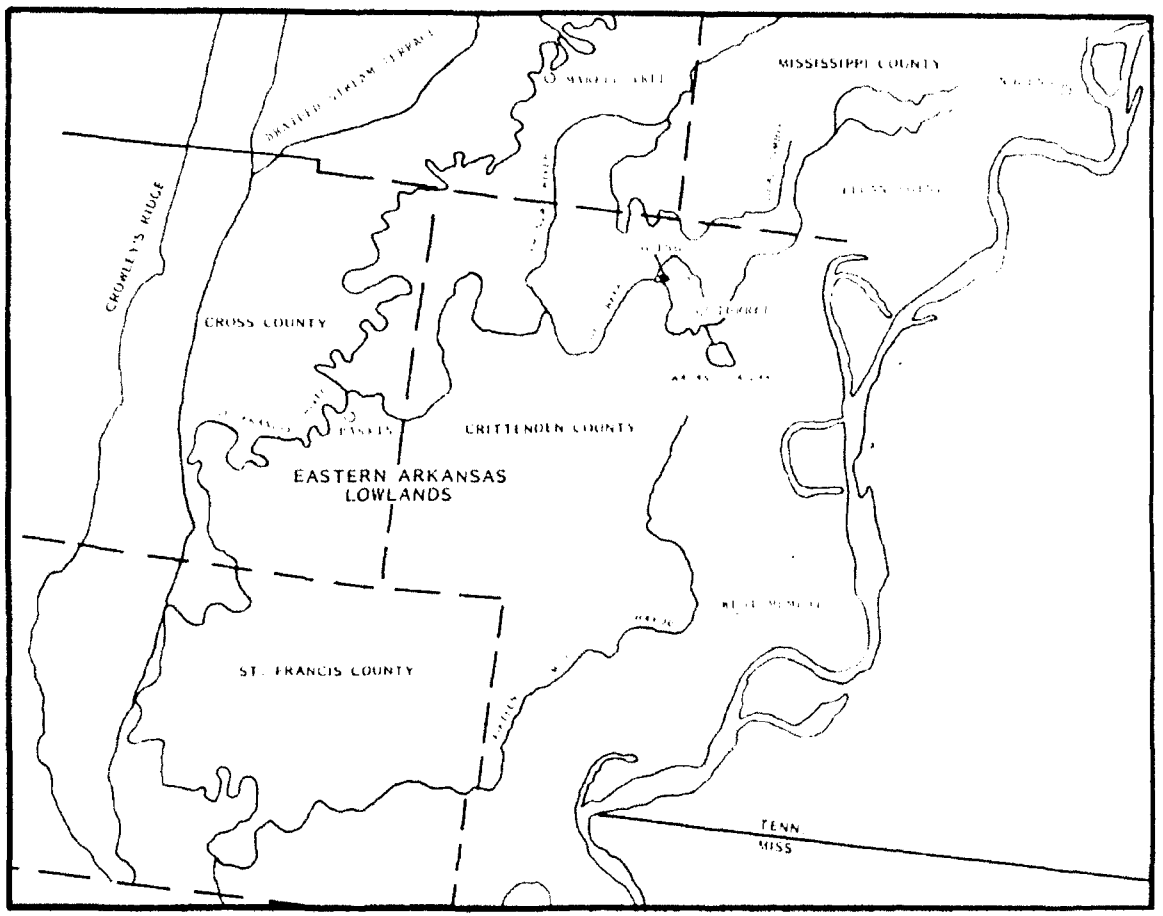

FIGURE 2. AREAL MAP SHOWING LOCATION OF 3CT50 IN RELATION TO LOCAL FEATURES AND GEOPOLITICAL BOUNDARIES.

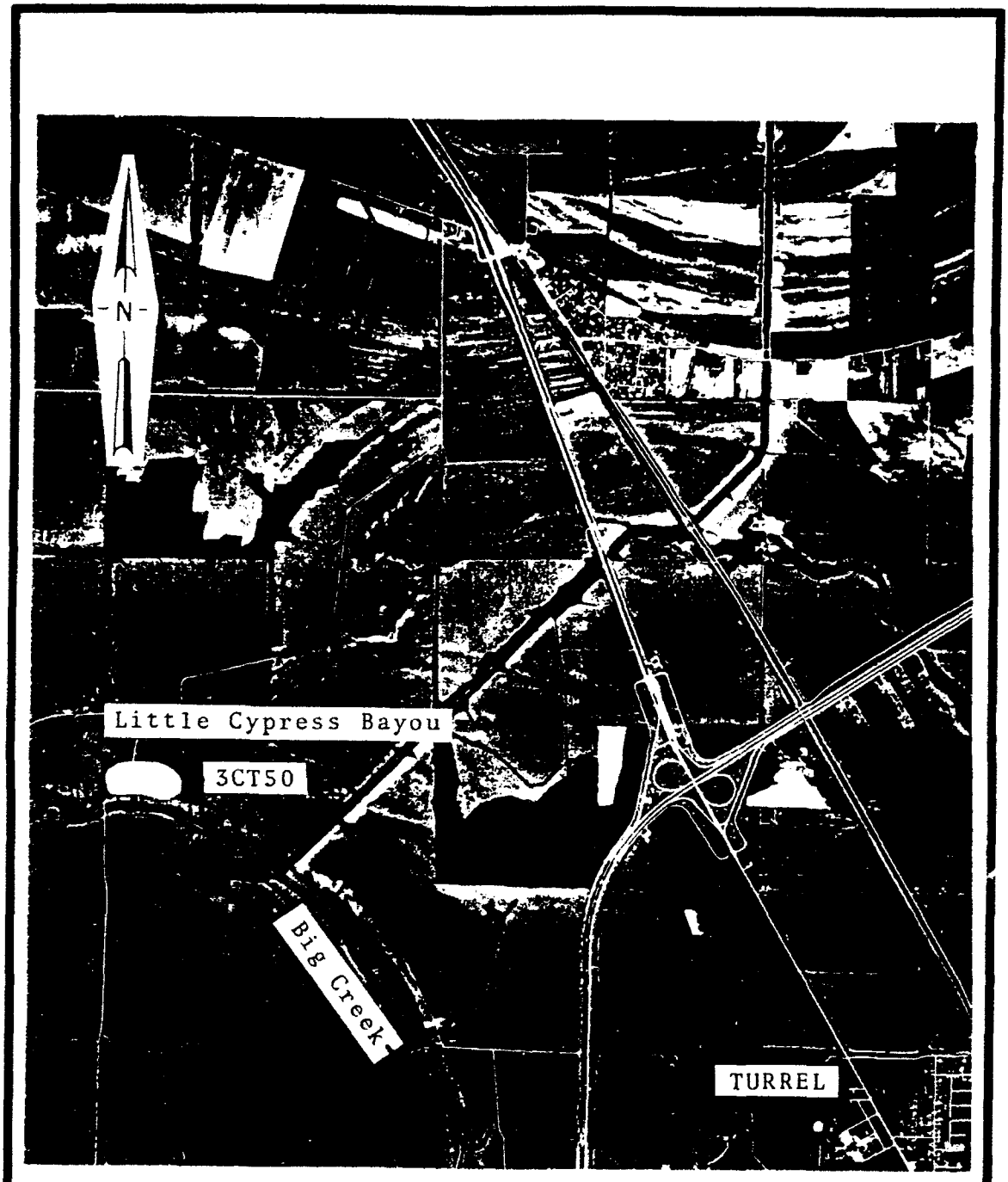

FIGURE 3. AERIAL VIEW OF 3CT50 SITE VICINITY.

FIGURE 4. GENERAL VIEW OF THE LITTLE CYPRESS BAYOU SITE PRIOR TO EXCAVATION, FACING NORTH TOWARDS THE NATURAL LEVEE.

FIGURE 5. VIEW OF THE CONFLUENCE OF LITTLE CYPRESS BAYOU WITH BIG CREEK TAKEN AFTER HEAVY RAINS. Photograph taken facing west (downstream) with the site situated 70 m to the north (right) of this view.

On the south side of Big Creek is another interfluvial plain that was formed by the abandoned meander of the Mississippi River. It is bordered by another relict levee or point bar formation that parallels the one north of the Big Creek 1.5 km distance.

Soils of the project area are variable in composition and origin, but generally fall within Sharkey-Tunica soil association. These soils are typically fertile (Gray and Ferguson 1974). They are formed primarily in backswamp areas, or in abandoned river channels where accretional building was very slow.

The site area, like most of the Eastern Lowlands, is now in cultivation. Drainage of local swamps and bayous has occurred through channelization projects so that the former appearance of most of northeast Arkansas is wholly unlike its present configuration. As mentioned earlier, prior to the instigation of drainage projects and flood control, the area was a vast forested region of backswamps and sloughs. The only habitable spots were the abandoned levee systems that bordered old meander channels, for prior to the construction of retainer levees along the St. Francis and Mississippi rivers, the entire Eastern Lowlands was frequently subject to inundation during periods of high water.

Previous Research at Little Cypress Bayou

The Little Cypress Bayou site was initially recorded in August 1971 by two amateur archaeologists who also noted the presence of a "mound" at the site though they did not elaborate on its possible contents, origin or relationship to the site.

In May 1979, Iroquois Research Institute (Iroquois) conducted intensive survey and background research for cultural resources within the Big Creek Excavation Project (BCEP), Item 2 (Iroquois 1979). While Iroquois' field reconnaissance located a number of prehistoric and historic sites within the BCEP, Item 2 project area, a records search of the AAS site files produced the previously recorded 3CT50 site form. A field examination of the site was made by Iroquois to verify the site's existence and to assess its potential for eligibility for nomination to the National Register of Historic Places (NRHP).

After a general reconnaissance of the site area, Iroquois field crews established a datum point and laid out a series of 10 m sq collection units in two transects that were oriented north-south and east-west (Figure 6). Within these collection units a two meter square area was completely collected, while artifacts in the remainder of the 10 m sq were collected on a selective basis. Spot checks were made outside of the collection grid in order to ascertain the horizontal surface extent of cultural remains.

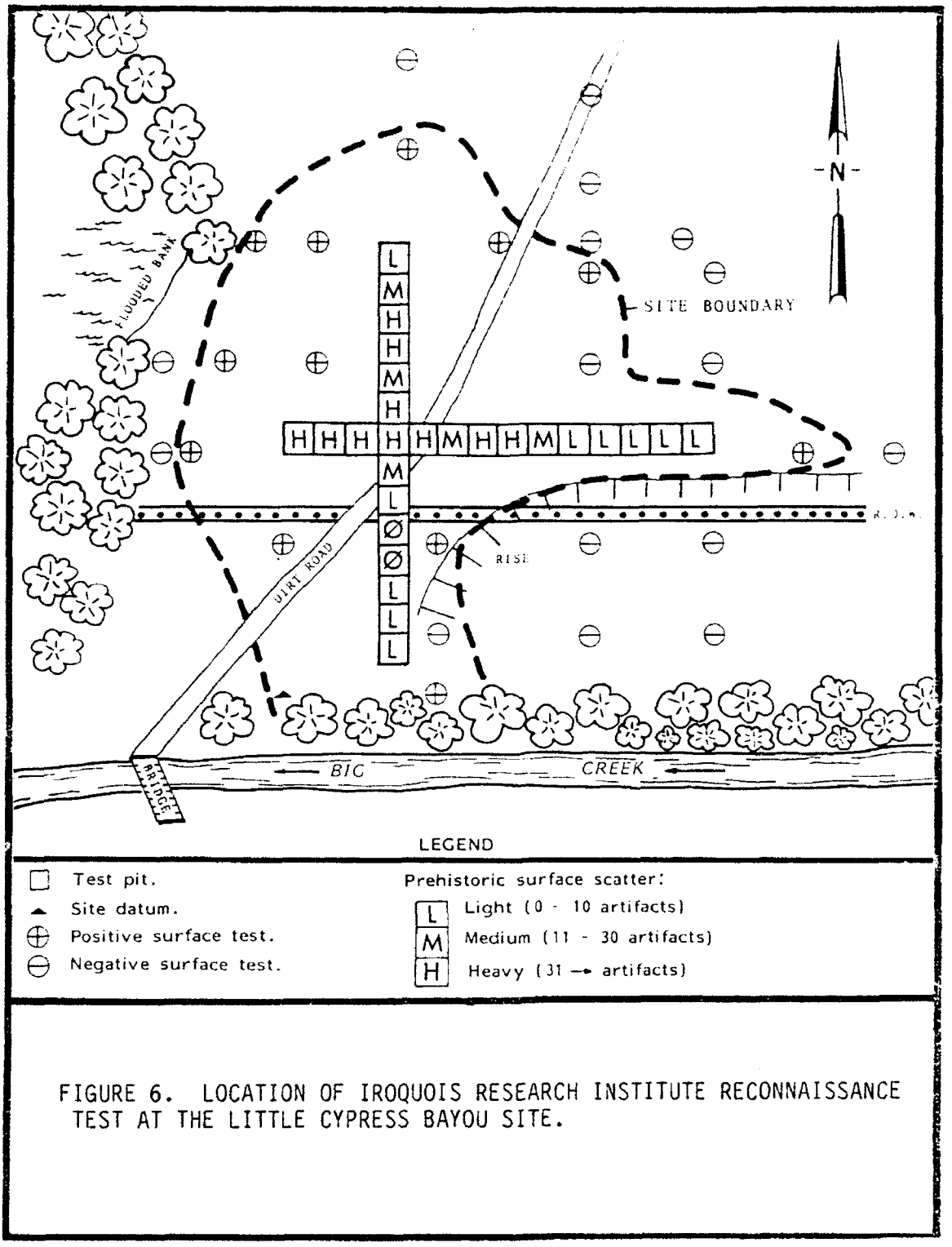

FIGURE 6. LOCATION OF IROQUOIS RESEARCH INSTITUTE RECONNAISSANCE TEST AT THE LITTLE CYPRESS BAYOU SITE.

A single one meter square test unit was placed on the site in the area of the collection grid that had produced the highest artifact density. Excavation proceeded in three consecutive 10 cm arbitrary levels to a maximum depth of 30 cm below ground surface. Only the first level, which was contained within the plowzone, produced any cultural material Levels 2 and 3 produced no cultural remains so excavation was terminated (Iroquois 1979:73-75).

A total of 1618 artifacts were collected by Iroquois' reconnaissance of site 3CT50. Based on the analysis of these materials it was determined that evidence for occupation of the site during the Middle to Late Archaic periods, the Late Woodland/Baytown period and Mississippian period was present. Iroquois (1979:75) further concluded that the main occupation of the site was during the Late Woodland period.

Iroquois recommended the site be nominated to the NRHP on four bases: 1) high artifact density; 2) extensive size, especially in comparison with other sites within the BCEP, Item 2 project area; 3) the presence of human bone; and 4) evidence for occupation during several prehistoric periods. These findings were submitted to the Corps in a final report (Iroquois 1979), which also included recommendations for mitigating adverse effects to 3CT50 by the impending Big Creek channel excavation and bridge construction project.

As part of an overall plan for the management of cultural resources located within the BCEP, Item 2 area, the Corps issued a request for proposals to conduct "Archaeological Mitigation, Analysis and Report Preparation for a Portion of Site 3CT50 on Big Creek, Item 2, Crittenden County, Arkansas." In response to this solicitation NWR submitted a proposal to the Corps and was subsequently awarded the contract.

Requirements of the Phase I project included six primary tasks. These were:

1) delineation of site boundaries;

2) excavation of ten 1 m by 1 m test units;

3) controlled surface collection;

4) location and marking of subsurface deposits;

5) stripping of the plowzone from an area of approximately 1400 sq m within the construction impact zone to expose subsurface features and deposits; and

6) protection of exposed deposits.

Following the interim two month period after completion of Phase I activities, Phase II study at the Little Cypress Bayou site began. This phase included:

1) excavation and removal of all cultural features located within the impact zone; and

2) excavation of 52 m^2 of cultural midden located during Phase I near the base of the levee, on which the majority of the site is located.

These tasks were completed in May 1983. Following field work, analysis and background research began as part of Phase III. These activities, along with the field procedures, were directed toward addressing a series of research questions that are both regional and site-specific in nature. However, it must be noted that our investigators were confined to the Corps' construction ROW and this did not extend over the entire area of occupation at 3CT50 (Figure 7).

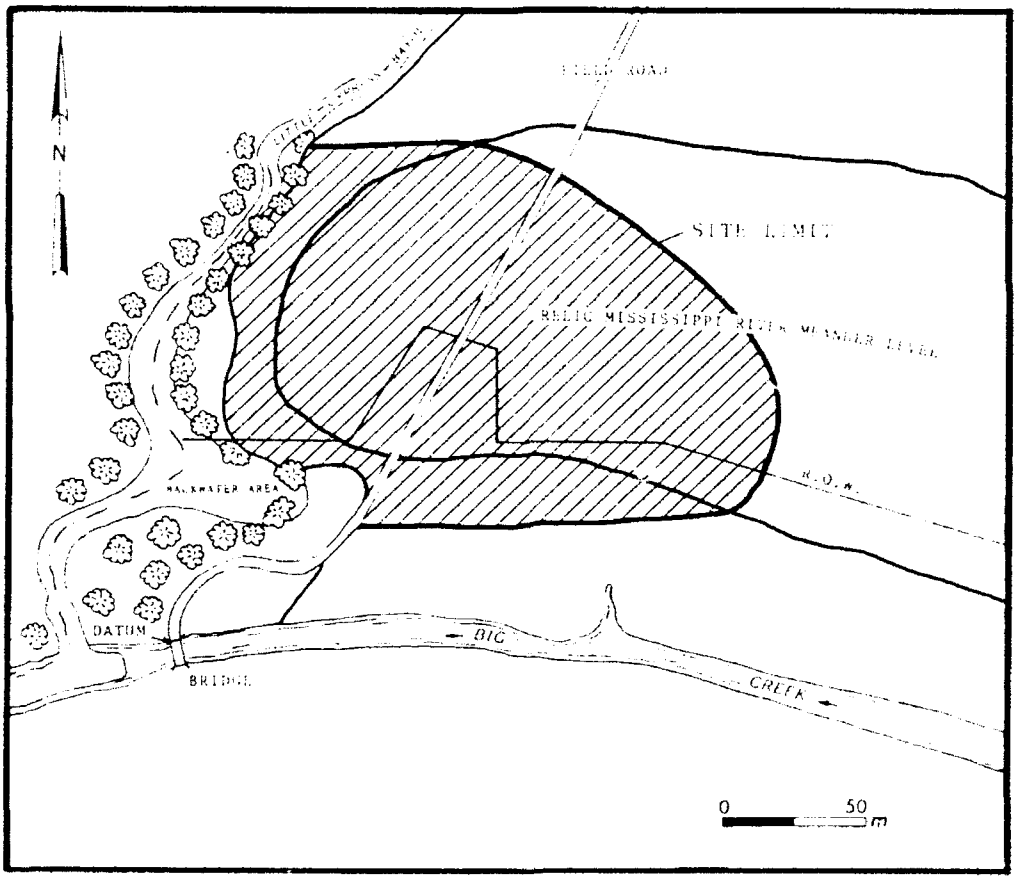

FIGURE 7. LOCATION OF 3CT50 SITE AREA IN RELATION TO THE U.S. ARMY CORPS OF ENGINEERS CONSTRUCTION RIGHT-OF-WAY.

That limitation not withstanding, the data recovered from even a portion of the site was considered valuable in terms of contributing to the prehistoric data base of northeastern Arkansas. The excavations have not answered all research questions, but we have, at least, been able to address aspects of each one. Further, we feel that the data recovered from investigations at 3CT50 has proved a comparable example to contemporaneous sites in the Central Valley (e.g., Brougham Lake).

In the following chapters, we present a review of pertinent environmental and cultural data on northeastern Arkansas, as well as details on our investigative procedures and results. The project was a multi-disciplinary undertaking which involved a number of outside consultants in addition to NWR staff. Several of these consultants produced extensive reports on their area of analysis. However, in the hope of presenting a synthetic study of the Little Cypress Bayou site, we have tried to integrate the specialized analyses data with the archaeological data. The texts of consultants reports appear in toto as Appendices I through VII in Volume II. Also presented in Volume II are stratigraphic, feature and artifact summaries and discussions (Appendices VIII through X). For this draft report, the Scope of Work (scope) is Appendix XI.

CHAPTER TWO

REGIONAL DATA BASE AND ENVIRONMENT

A. Merrill Dicks
John P. Lenzer
William Johnson

NWR's investigations of 3CT50 were oriented toward a reconstruction of the site's occupational history and, by extrapolation and the use of comparative data, its relationship to contemporaneous sites in the region. We were exploring patterns of human adaptation to a variety of conditions, not the least of which was the natural environment. The relationship between culture and the natural environment is at once complex and dynamic, a situation well recognized by the archaeological community and long discussed in the archaeological literature (D. Morse and P. Morse 1983; Butzer 1982, 1971; Morse 1980; Morse et al. 1980; Klinger 1978b; G. Smith 1978; Fehon 1975; Schiffer and House 1975; Sanders 1962).

To understand the adaptations of prehistoric groups as a response to their environment, it is critical that we also understand as much as possible about the world in which different cultures operated. As such, the 3CT50 investigations incorporated geomorphological, environmental, and palynological studies into the overall archaeological data recovery plan. To set the stage for ensuing discussions of culture history and research issues, the first part of this chapter has been devoted to a discussion of the interpretations drawn from the environmental studies as they combine to form a regional data base.

The scope of this data base is restricted primarily to the Eastern Lowlands region of the Central Mississippi Alluvial Valley, as well as

to those time frames during which the prehistoric cultural occupation of the Little Cypress Bayou site occurred. Overlap of this data base with adjacent regions and time frames was necessary, however, in order to place the prehistoric utilization of 3CT50 into a broader and comprehensible perspective.

The second part of the chapter is a detailed discussion of the lithic resources that were utilized and exploited by prehistoric cultures in northeast Arkansas. The distribution, availability and inherent qualities of these raw materials are variables that are highly significant in addressing research questions related to prehistoric economic and social behavior.

The last part of this chapter reviews some of the major characteristics and trends believed to be associated with the different periods in prehistory. The overview of culture history, which is based upon current knowledge derived from archaeological research conducted in this region, examines the long-held views, as well as some controversial hypotheses that challenge these views.

Together, the three parts of the chapter form a corpus of data from which research questions are raised and by which results of the data recovery program can be interpreted.

GEOMORPHOLOGICAL HISTORY AND ENVIRONMENTAL SYSTEMS OF THE EASTERN LOWLANDS REGION

Theoretical Perspective

As noted in the introductory comments to this chapter, the reconstructions of geomorphological history and environmental conditions have become integral parts of current archaeological research concerned with explaining human behavior. The role that the natural environment has played in structuring human adaptive systems has frequently been found to have been a major one (Styles 1981; Klinger 1978b; G. Smith 1978; Jochim 1976). This aspect of the relationship between man and the natural environment is one that becomes increasingly more evident further back in time.

In the past, the interface between human adaptation and the natural environment was larger and more localized than it is today. Primarily, as a result of population increases, and the shift from extractive to exploitative subsistence economies, individuals have become increasingly isolated from the natural environment. In industrial society, the cultural environment has become the primary concern of individuals and it is the "cultural world" towards which adaptive behavior is oriented.

This has obviously not always been the case. In prehistoric northeast Arkansas, it is apparent that, unlike today, the configuration of the natural environment was a decisive and influential

element in dictating the structure and organization of cultural adaptation. Practically speaking, a study of the environment, in detail, is a methodological necessity since in a riverine setting, such as is found in the 3CT50 study area, dynamic processes of alluvial deposition and erosion may also have a profound influence upon the appearance and preservation of archaeological deposits.

Because riverine settings are dynamic energy systems, they also tend to be exceedingly complex. The relationship between geomorphological processes such as erosion and deposition, floral and faunal community succession, drainage and duration of inundation, as well as microclimatic and macroclimatic conditions, are all relevant to understanding this environment.

In such environments, terrain is closely related to alluvial conditions, and variability in drainage features tend to correspond to a combination of elements that merge to create variability in topography. Plant succession is closely related to landform because land surfaces are constantly being created, or removed and built up, or taken down by alluvial action. Vertical separation of animal and plant communities occurs due to landform variability in soil drainage, in soil fertility, and in the susceptibility of various topographic settings to excessive periods of inundation. And, equally as important as environmental diversity is to explaining prehistoric cultural behavior, the spatial distribution of this environmental diversity must be determined.

This simplified version of the complex set of factors that combined to establish variability in the riverine environment merely serves to illustrate both the dynamic aspect and potential biotic and abiotic diversity of the Lowlands environment. The study of geomorphology and environment in relation to site(s) investigated can utilize a variety of approaches. The first is a review of available records such as government land office (GLO) survey notes, pollen records, and paleo-botanical and paleo-faunal information; each has been utilized by archaeologists working in the Central Mississippi Valley.

These sources of data are useful in trying to characterize past environments, but, alone, they also have limitations. King (1978), Wood (1976), and Bourdo (1956) have all discussed problems with the direct application of GLO survey data to paleoenvironmental reconstruction. Taking just one of these researchers as an example, King (1978) noted that observations on vegetational composition made by GLO survey records, but in reference to a prehistoric situation, may be skewed because of climatic changes that brought about more recent alterations in the floral communities.

Pollen records are also a valuable aid, but unfortunately, with one notable exception (King and Allen 1978), they are virtually absent in the Central Valley region. And, as Butzer (1971) has pointed out, there can be severe interpretational problems with data obtained from

such studies. Paleo-botanical and paleo-faunal data are equally valuable for evaluating the resources that were available for exploitation during prehistory, but such information pertinent to the Central Valley is principally derived from adjunct studies carried out as part of archaeological site investigations (cf. Klinger et al. 1984; Klinger et al. 1983; Klinger 1982; Roth 1980; G. Smith 1978). While excellent for cross-studying data from contemporaneous occupations, these specialized analyses do not always give us the 'whole picture' in terms of the range of resources that were potentially exploitable. When trying to deal with seasonality or explain a particular site function, knowledge of those that were exploited should be coupled by an examination of those resources that were not.

Another avenue available to archaeologists' environmental reconstructions, and the one being integrated into large scale projects on an increasingly frequent basis, are formal geomorphological and paleo-environmental studies in conjunction with the archaeological investigations (cf. Foss 1983; Butzer 1974, 1977; King and Allen 1977; Saucier 1974). The data recovery program at 3CT50 was designed to include such studies, the results of which are synthesized in this section of Chapter Two and repeatedly used as a reference point throughout the other two sections, as well as subsequent chapters in the report. The complete reports on these studies are presented as appendices to this report (Volume II):

Appendix I -- Geomorphology and Geomorphic History (John P. Lenzer)
Appendix II -- Faunal Remains from the Little Cypress Bayou Site (3CT50), Crittenden County, Arkansas (Arthur E. Bogan)
Appendix III -- Macro Paleobotanical Analysis (Andrea Shea)
Appendix IV -- Bioarchaeology of the Little Cypress Bayou Site (Jerome C. Rose, Murray K. Marks, Larry L. Tieszen)
Appendix V -- Analysis of Botanical Microfossils from 3CT50 (Glen C. Fredlund, Steven Bozarth)
Appendix VI -- Radiocarbon Dates
Appendix VII -- Archeomagnetic Results from Samples Collected at 3CT50 (Daniel Wolfman)
Appendix VIII -- Correlation of 3CT50 Arbitrary Excavation Levels with Natural Stratigraphy
Appendix IX -- Feature Data
Appendix X -- Artifact Analyses
Appendix XI -- 3CT50 Scope of Work

The goal of the geomorphological and environmental study was to provide a confident measure of: 1) the range of biotic and abiotic diversity in the prehistoric Lowlands environment; and 2) spatial distribution and availability of this diversity in that same environment. Two major processes are of particular importance in achieving a confident measure of these factors. The first is change in the alluvial systems of deposition and the second is change in climatic conditions. These processes are not mutually exclusive.

Climate has exercised a profound effect upon the geomorphological processes of the Mississippi River drainage and its lowland tributaries. The Mississippi drainage system has shifted between two basic patterns, meandering and braided, in response to climatic changes associated with glacial retreat and rises in sea level. Minor fluctuations in climate, such as those related to rainfall, have, to a degree, also affected alluvial processes; however, from the perspective that characterizes the alluvial systems as either braided or meandering streams, such seasonal climatic fluctuations have not induced alterations in drainage features beyond the confines of the individual systems.

Although climatic change has had a well documented effect on biotic composition (King and Allen 1977; Delcourt and Delcourt 1975; Butzer 1971; Bryson et al. 1970; Wright 1970), our initial concern is with its influence on alluvial processes and how these processes have, in turn, shaped and altered the range and extent of environmental diversity. The companion effects of climatic and alluvial processes are related to the development, as well as the destruction or alteration, of riverine topographic features. Episodes of flooding, as well as deposition and the formation of new land surfaces may also be correlated with the development of distinct biotic communities. Variability in soils is further related to alluvial processes and biotic diversity.

Taking all of these effects and responses into consideration, the range and distribution of environmental diversity can be examined within the contexts of either a meandering or braided stream system. It is primarily within the former, a meandering system, that occupations at 3CT50 existed, but from a regional perspective both the meandering and braided system environments had to have exerted some influence on its' occupants adaptive behavior.

The combined data from available records, comparable literature, and field observations have formed the basis for advancing a hypothetical model of the environmental conditions that characterized the prehistoric setting of 3CT50. The development of this model begins with an examination of geomorphology and geomorphic history.

Geomorphology and Geomorphic History: Regional Background

The study area lies within the eastern portion of the Arkansas Lowlands region. This extensive lowland is divided into eastern and western halves by Crowley's Ridge, a Tertiary upland remnant that extends from Missouri into Arkansas, to a point on the Mississippi River below Memphis, Tennessee and adjacent to West Helena, Arkansas. The entire region is contained within the Central Mississippi River Alluvial Valley and constitutes a northern extension of the Gulf Coastal Plains physiographic province (Fenneman 1938).

The geology, geomorphology, and geomorphic history of the Mississippi River alluvial valley was reported by Fisk (1944) in detail; his synthesis was based on the mass of Corps and private data

available at that time. Since then, his absolute age determinations have been largely abandoned, although the framework of his interpretation remains in use. Saucier (1970) has investigated both the Saint Francis Sunk Lands west of the study area, and the Saint Francis Basin as a whole (Saucier 1964). The latter report involved mapping, at the scale of 15 minute U.S.G.S. quadrangles, the geomorphic and stratigraphic features of the basin, using Fisk's data and additional information. Saucier's other extensive Corps mapping projects led to his modification and simplification of Fisk's regional framework (Saucier 1974).

Two additional geological analyses of archaeological sites on Mississippi River meanders (both in Mississippi) have been helpful in developing the geomorphological data base for the Little Cypress Bayou site. They are Saucier's (1977) analysis of the Teoc Creek Site, and Gagliano and Weinstein's (1979) report on their cultural resources survey of the Upper Steele Bayou Basin.

Data gathered during the course of these investigations, and others not mentioned, indicate that at least eight major episodes of continental glaciation have occurred in the past three million years. During each of these periods of sea level fall and rise, the Mississippi River and its tributaries entrenched and widened the valleys in which they had cut into the gently-dipping tertiary sedimentary rocks of the Mississippi Embayment and Gulf Coastal Plain. The present Mississippi River Alluvial Valley is largely the product of erosion and deposition during the last 80,000 years. This span includes two major glaciation episodes, separated by a return of conditions like those of the present, and the geological present (or 'Holocene') which began some 10,000 to 11,000 years ago.

During the severe glacial-interglacial cycles, the Mississippi River and larger tributaries have shifted between two basic states; meandering and braided. Since the end of the Pleistocene epoch, this drainage system has changed from a braided pattern to a meandering stream system, an alteration that was gradual and extended over thousands of years. Beginning below the latitude of Baton Rouge, Louisiana, the Mississippi River changed from a braided to a meandering stream, possibly as early as 12,000 years B.P., and primarily in response to a rise in sea level that corresponded to reductions in glacial ice sheets further to the north. This process of changing stream systems progressed northward until the Central Valley section of the Mississippi River became a meandering stream between 9000 and 7500 years B.P. (Saucier 1974).

Since that time, the Mississippi River has occupied a number of successive meander belts, deposits of which characterize much of the Central Valley region. Braided stream deposits are present in the Western Lowlands region and also comprise an extensive terrace formation in the Eastern Lowlands adjacent to Crowley's Ridge. East of this upland formation are relict meander belts and the present active meander belt of the Mississippi River.

Geomorphic Features

The geomorphic features of the valley floor in the region which includes 3CT50 include: 1) several levels of braided stream terrace (formed as floodplains when coarse glacial outwash clogged the ancestral Mississippi River and its tributaries; 2) relict and active meander belts built predominantly by the Mississippi River in the past 8000 years, after the glacial sediment supply was reduced; 3) the eastern wall of the alluvial valley (a line of low bluffs and hillslopes leading up to the dissected tertiary bedrock uplands); and 4) Crowley's Ridge (a narrow, north/south elongated strip of tertiary upland, which divides the Saint Francis Basin from the Western Lowlands). Figure 8 and Table 1 show Saucier's (1974) interpretation of the extent of these features, and their approximate dates of formation.

The following paragraphs combine a summary of the processes and products of the meandering and braided states with definitions of geomorphic and sedimentological terms used in other sections of this report. More detailed descriptions and explanations of the activities of major meandering and braided rivers can be found in Reineck and Singh (1975), Allen (1970), Leopold et al. (1964), Fisk (1944), and Russell (1936).

In its present meandering regime the mean-flow Mississippi River bedload is silt and fine sand, which is subordinate in mass to the suspended load of clay and silt. Several well-defined depositional and erosional environments comprise the meanders, which loop from side to side across a mean down gradient axis.

The channel lies between erosional cutbanks, which generally occur on the outer, concave banks of meanders, and depositional point bars which form the inner, convex banks. Channel sediments are the coarsest complexly stratified deposits in the meandering river. Erosional and depositional processes are commonly inactive or reversed along segments of these two bank types. The prehistoric Mississippi River channel in this area was typically one to two kilometers wide.

Individual meander-forms change as erosion and deposition proceed through annual cycles of spring and early summer floods, and periods of slow flowing, low water. Lateral migration of a meander produces "ridge and swale," or "scroll" topography on the insides of meanders. This comprises a series of point bars separated by low, swamp parallel depressions. Distances between successive Mississippi River point bar crests are commonly around 500 m. Sudden changes in channel orientation due to local cut-offs, create adjacent ridge and swale topography with different orientations. Point bar sediments are cross-stratified and horizontally-stratified sand and silt.

Flooding also builds natural levees--elongated low ridges made of silt and sand which are dropped as the floodstage river rises over its banks and its velocity (hence its transporting power) is reduced.

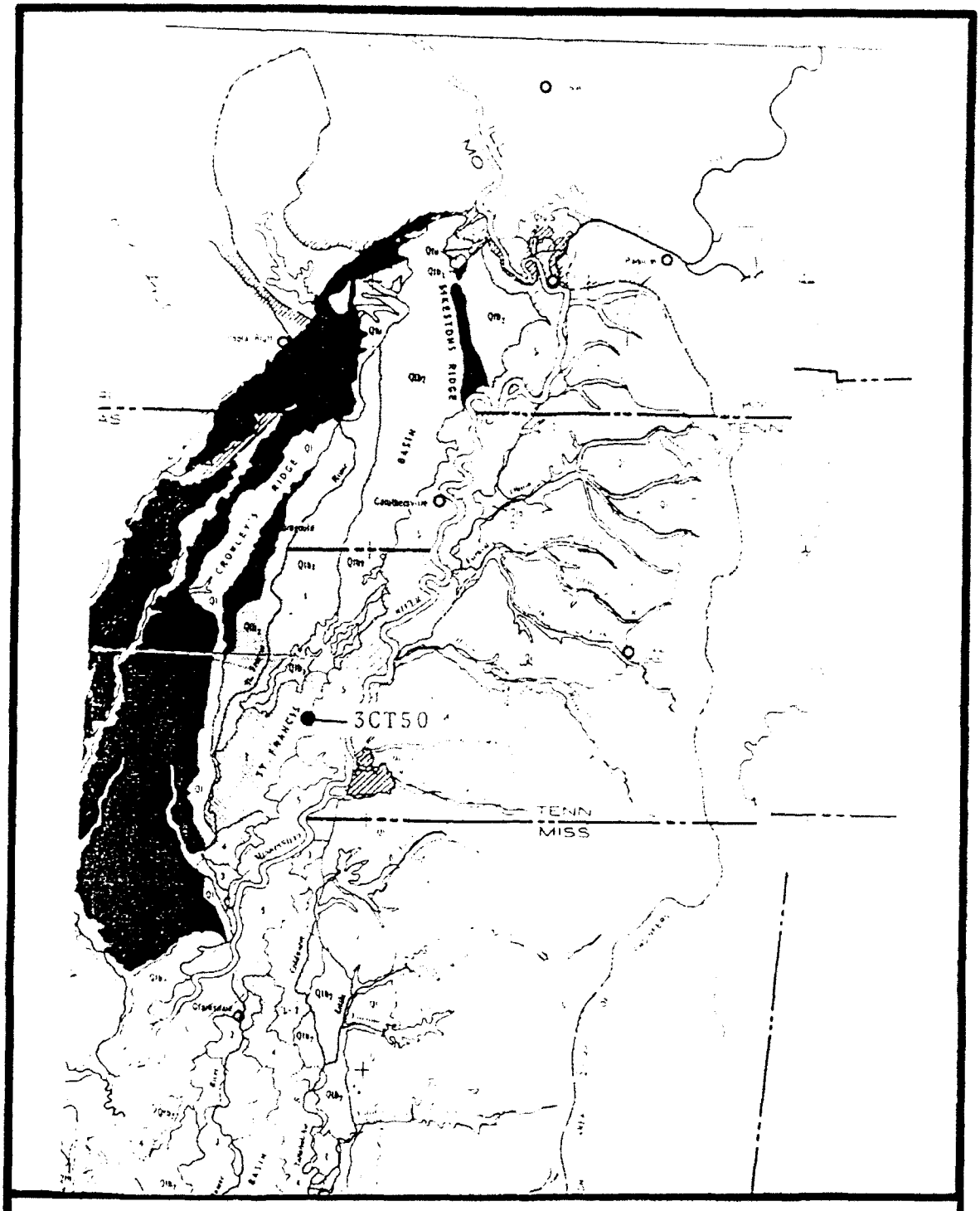

FIGURE 8. GEOMORPHIC FEATURES IDENTIFIED IN GENERAL PROJECT VICINITY (from Saucier 1974: Deckerville section).

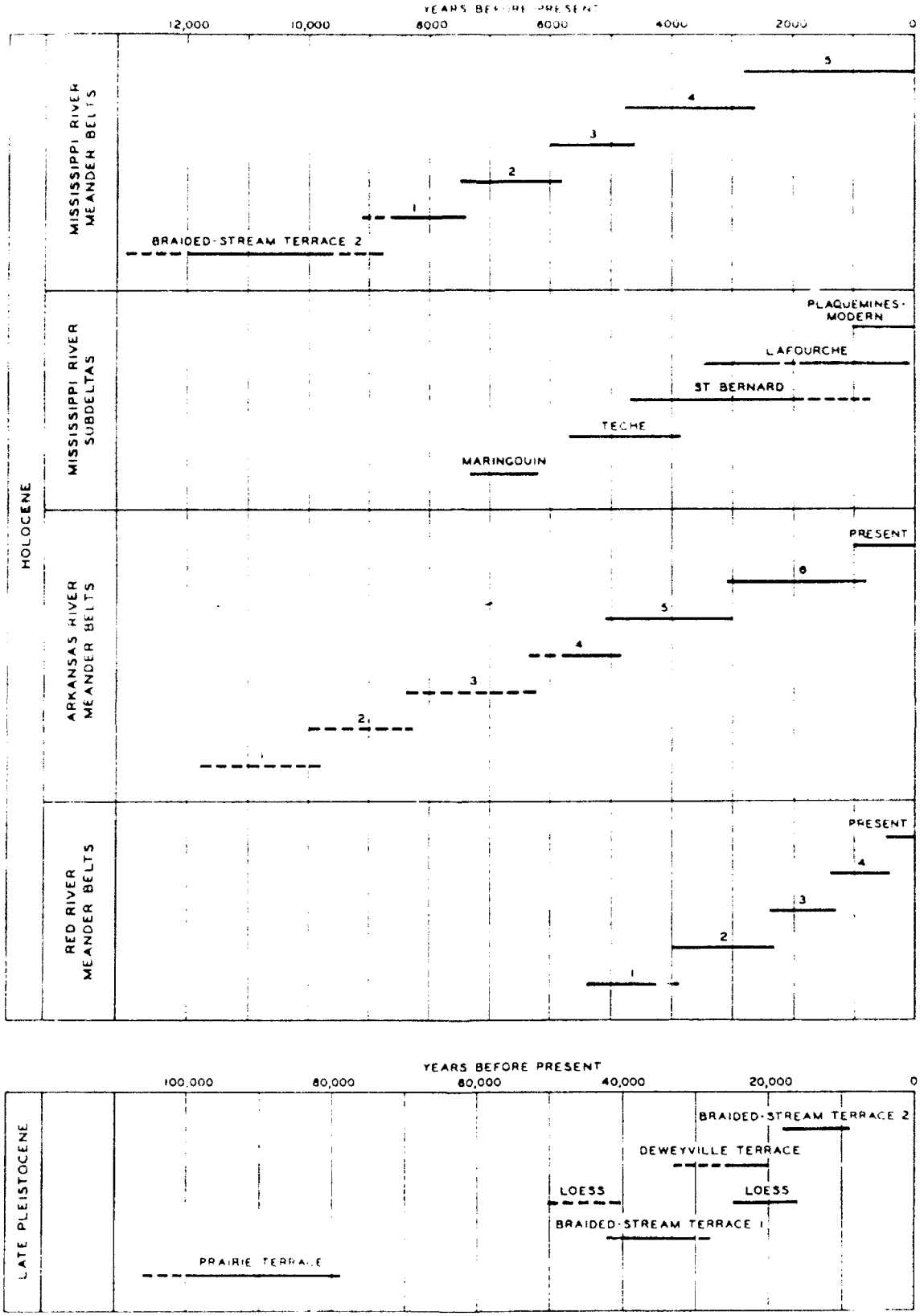

TABLE 1. GEOMORPHIC FEATURES IN THE VICINITY OF 3CT50 (from Saucier 1974).

Clays settle where a flood begins to wane. The natural levees slope very gently down to the adjacent portions of the floodplain--the poorly drained backswamps. Levee widths of two to three kilometers on each side of the channel are common and the crests of the natural levees can be as high as two to three meters above adjacent backswamps.

Backswamps, also known as interfluvial flats, aggrade very slowly compared to the natural levees. The sediments deposited in this environment are usually slow-settling clays of the suspended load. The crest and the extensive sheets of sub-horizontal layers are broken at intersections of tributaries and cutoff meanders with the Mississippi River, and at crevasses.

A crevasse is another floodstage product of the river, formed when floodwaters concentrate in a low portion of a levee crest, and cut a minor channel to the backswamp. Alluvial fans of silt and fine sand typically form where a crevasse channel spreads into distributaries. A crevasse can close up in a few years; it might also persist, deepen, and allow drainage from the backswamp back to the river during low-water periods.

Erosion sometimes leads to abandonment of a portion of a meander. An "oxbow lake" is formed when sand and silt bars close the ends of an abandoned meander. High water and overbank flooding eventually fill an oxbow lake with clay which is rich in organic material. Occasionally a series of meanders will be cut off, leaving an "abandoned course" or "relict meander belt." A meander belt comprises all of the features described above, except for bordering backswamps. An active bordering Mississippi River meander belt is five to ten kilometers wide.

The various Alluvial Valley histories have been based on the determination of the relative ages of such abandoned courses. This determination is based on cross-cutting relationships, and on gradual slope degradation and burial of inactive courses as valley floor aggradation proceeds. It is made more difficult by the presence of partial flow courses, in which the main channel splits for some distances into two meandering courses. The reduced flow in each produces a reduction in meander dimensions. Other causes of interpretive confusion and lack of precision are the re-occupation of an abandoned meander belt, and the long-continued occupation of a single meander belt.

The present overall physiographic appearance of the Central Mississippi Valley has, to a great extent, been dictated by the past activities of the Mississippi River. Within the Holocene, deposits represented by present and abandoned Mississippi River meanders, secondary streams, and tributaries, tend to align their courses with these relict flow patterns. As Saucier (1974:11) noted:

> In some instances the smaller streams have completely conformed to the general linear trend of the larger streams, while in other instances, they have created their own small meander belts generally or totally within the confines of the larger relict channel. In both cases the smaller streams have usually built up their own natural levees which are distinguishable on the basis of age from the relict channel levees.

The overall Mississippi River pattern of north to south flow is, therefore, mimicked by the conglomeration of stream and rivers that drain the lowlands region and the adjacent uplands. This drainage pattern is likewise accompanied by both the relict and active topographic features that are associated with stream geomorphology. Levees, sandbars, ridge and swale topography, backswamps, and oxbows all tend to conform to the same general pattern. In instances where smaller streams occupy larger abandoned channels, a series of secondary topographic features develop that frequently parallel the existing relict topography of the abandoned stream course.

The braided Mississippi River was simpler in its types of geomorphic features and sedimentary environments, but more complex in its form. The sand bedload was derived from glacial deposits which were winnowed by water from the melting continental glaciers to the north. The abundance of this sand caused the river to spread into rapidly-changing, anastomosing channels, separated by low, elongated, complexly-stratified bars. Silt and clay were important components of the sediment load, but the sand content controlled the form of the river. Transitions between the meandering and the braided regime apparently occurred geologically rapidly, in response to changes in discharge, sediment load and valley slope (Leopold et al. 1964:293ff; Schumn 1977:159ff). Saucier (1974:19-21) felt that a braided stream regime of the Mississippi River in the Saint Francis Basin lasted from approximately 18,000 years ago to perhaps 6000 years ago. When the Mississippi River shifted its course from the west side of Sikeston Ridge to the east side, the Mississippi and Ohio rivers joined, and rapidly formed a meander belt along the eastern side of the alluvial valley.

Environmental Systems: Regional Background

Environmental diversity within the Arkansas Lowlands is predominantly the result of a combination of biological and physical elements, the former of which is dependant largely upon the distribution and nature of the latter. Factors such as soil type and drainage, and the susceptibility of topographic features to inundation by flooding, as well as the average duration of inundation, all contribute heavily to the distribution and composition of distinct and local biotic communities.

The physical elements of the terrain within the Central Mississippi Valley tend to parallel and include water drainages, which in turn predominantly flow from north to south. The distinct biotic

communities, therefore, tend to be linear phenomena since they correspond closely to the distribution of the landforms that parallel the major drainage. Although it is not always true, overall, maximum biotic diversity is achieved over the shortest possible distance by travelling east or west across the valley. Conversely, less biotic and physical variability is encountered by moving north or south since movements in these directions tend to be more aligned with existing topography. Individual bio-physical divisions may, therefore, be perceived as linear entities that tend to be parallel to and juxtaposed close to each other.

An interesting aspect of the relationship between the lowland terrain and the biotic environment is that the latter is subject to changes in the former. Braun (1975:295) summarized this relationship as follows:

> The communities of river bottoms [and] developmentally related swamp and river border communities...are, as deposition proceeds, replaced by mixed bottomland forest...of the hardwood or glade bottoms type. The stages in development differ from place to place, as indeed do the constituent species of the several communities... Excessive local deposition, resulting in the formation of natural levees and of the low cernuous ridges between bayous, permit the entrance of less hydric species...The frequent appearance of mesophytes in the best drained sites points toward the establishment of a mesophytic forest containing some of the species of the slope forest.

The approach outlined above entails combining physical and biological elements into discrete and meaningful divisions. This approach is certainly not new, and draws fully from the work of previous researchers. Studies of a similar nature that are generally more oriented toward systematic ecology than pure description, as this study tends to be, includes Harris (1980), Braun (1975), Lewis (1974), Minckler (1973), Hosner and Minckler (1963), Smith (1955), Shelford (1954), and Simonson (1947). A similar study along these lines, that details the interaction of human groups with discrete combinations of terrain elements, is Klinger's (1978b) article on prehistoric settlement patterns in northeast Arkansas.

The following discussion details a hypothetical bio-physical cross-section of a single model drainage within the Central Mississippi River Valley. The purpose of this discussion is to demonstrate and describe the amount of environmental diversity that exists within the Mississippi Valley. Such information can be used in discussions related to the human exploitation of the northeast Arkansas Lowlands environment.

While specific elements of the terrain and individual biotic constituents have certainly changed through time, and may in no way approximate the present appearance of the northeast Arkansas

landscape, the factors that govern both the degree and orientation of bio-physical diversity have effectively remained the same since the Mississippi River shifted from a braided to meandering stream system between 7000 and 5000 years B.C. The pattern of diversity and the spatial arrangement of bio-physical zones demonstrated by this model should, therefore, be applicable to the situation at site 3CT50, where the major occupation occurred between 600 A.D. and 1000 A.D.

Floral and Faunal Composition of the Arkansas Lowlands

Braun (1975) includes the Central Mississippi Valley in the Southeastern Evergreen Forest Region. While this forest region is locally diverse, it is also broadly typical of the flora and fauna that are present in the Gulf Coastal Plain physiographic province, of which the Central Mississippi Valley is a part. This forest region is described as (Braun 1975:282):

> ...in part warm temperate-sub-tropical, in part distinctively coastal plain, and in part temperate deciduous. It is made up of a variety of widely different forest communities - coniferous, mixed coniferous and hardwood, deciduous hardwood, and mixed deciduous and broad-leafed evergreen hardwood-interrupted here and there by swamps, bogs and prairie.

The northeast Arkansas Lowlands are characterized by considerable diversity in plant species that can be grouped into somewhat discrete vegetational communities. These range from more xeric-oriented species that prefer the well drained and seldom inundated crests of levees and sand ridges to the hydrophytic plant species that inhabit aquatic and poorly drained areas. Associated with these communities are various fauna. While animals are generally much more flexible than plants in their habitat range and distribution, certain community preferences are usually observable. Such preferences would certainly have been important factors in scheduling and developing strategies for the acquisition of these animal resources by prehistoric groups.

Six bio-physical divisions have been delineated for the northeast Arkansas Lowlands area:

1) Active Aquatic
2) Newly Formed Active Terrestrial
3) Active Levee.
4) Interfluvial Flats
5) Non-active Aquatic
6) Not-active Levee Crest and Ridges

While these divisions are by no means entirely discrete entities, and their boundaries may be viewed as relatively fluid and vague, nevertheless, they are broadly representative of the amount of diversity that was prevalent in the local environment at 3CT50 during its prehistoric occupation. Figure 9 illustrates a hypothetical east-west

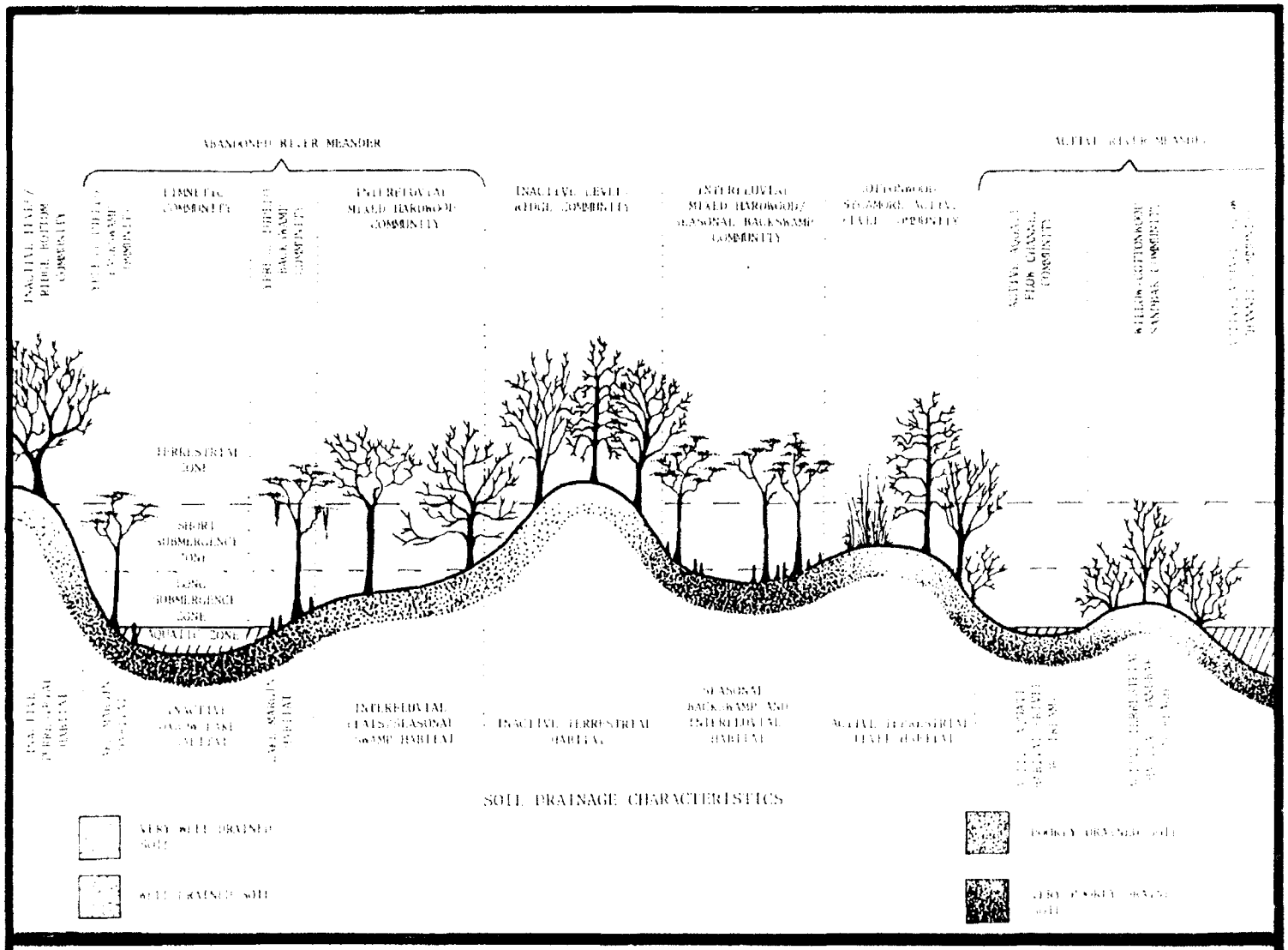

FIGURE 9. BIO-PHYSICAL SUBDIVISIONS OF THE CENTRAL MISSISSIPPI VALLEY LOWLANDS ENVIRONMENT.

cross-section of the lowlands terrain that incorporates all of these divisions into linear bio-physical community bands. Specific characteristics of each of these divisions are presented in Table 2. A more detailed discussion follows.

Active Aquatic Environment: This community includes the physical, as well as biological characteristics of permanent streams and rivers. In general, it does not include seasonally active, or slow moving, less dynamic sloughs and bayous. While these latter drainage features may at times become fast flowing, such episodes are generally limited in time and extent to periods of excessive rainfall. They are characteristically less active than permanent free flowing streams and rivers, and are discussed subsequently under Non-active Aquatic environments.

Active Aquatic environments are very dynamic, and the water courses are associated with rather specialized plant and animal communities. This is particularly true of the rivers and streams found in the Central Mississippi Valley. These characteristically possess a very high particle suspension or load that adds to the uniqueness of a fully aquatic environment. Plant life is primarily restricted to certain species of water grasses that are found along the margins of streams where fluctuations in the stream flood level permit periods of 'drying out' alternating with inundation.

Due in part to the general paucity of plant life, terrestrial fauna are also few and restricted in numbers and variety. Although numerous animals may occasionally frequent the river banks, for the most part, they do not actually live within the river or stream courses.

While species of fish are certainly found in the Lowland watercourses, they generally prefer the quieter backwaters and pool areas. Species typically found in dynamic river systems are, for the most part, absent in the streams of northeast Arkansas because of the high silt load. It should be noted, however, that historic land clearing has greatly accelerated erosion throughout the region. In the prehistoric past stream loads may not have been as consistently high as those measured today.

The picture which emerges from this discussion is that active aquatic habitats are typically low in bio-mass and were probably not as important as a source for food as some of the more productive, adjacent environments. Rivers and streams were, however, probably extensively utilized by prehistoric groups as a means of transportation, communication and trade. They would also have provided preferred locations for obtaining potable water.

Newly Formed Active Terrestrial Environment: Sand bars, spits and beaches represent newly generated land surfaces that can usually be found on the insides of river bends, or below constrictions, such as log jams, that interrupt and reduce stream velocity. Since such land

TABLE 2. BIO-PHYSICAL ENVIRONMENTAL DIVISIONS IN THE NORTHEAST ARKANSAS LOWLANDS.

Division	Topographic Situation	Floral-Faunal Composition	Soil Characteristics	Submergence Zone
Active Aquatic Environment	Free flowing rivers and streams	Very limited floral; primarily fish, few amphibians	Very poorly drained	Fully aquatic
Newly Formed Terrestrial Environment	Sandbars, beaches, spits, low-lying islands in or adjacent to free flowing rivers and streams	Sand bar willow - cottonwood; limited mammal (transitory), amphibians, reptiles	Well drained	Long term submergence
Active Levee Environment	Levee systems and elevated terrain adjacent to streams and rivers	Black willow - mature cottonwood, sycamore; large - small mammals, reptiles, amphibians, birds	Very well drained	Short term submergence
Interfluvial Flats Environment	Low-lying expanses between active drainages and on the back side of levee systems	Mixed hardwood - poorly developed herbaceous layer, varied terrestrial amphibious fauna	Poorly drained	Long term submergence
Non-active Aquatic Environment	Lakes, ponds, swamps, slow moving sloughs and bayous	Lamnitic lake community, cypress-tupelo association; amphibious-aquatic fauna	Very poorly drained	Fully aquatic and long term submergence
Inactive Levee and Ridge Crest Environment	Elevated sand ridges and relic levees not adjacent to active stream courses	Mesic hardwoods - well developed herbaceous layer; numberous terrestrial fauna	Very well drained	Fully terrestrial - infrequent short term submergence

surfaces are effectively void of vegetation when they initially form, the plant types that first appear and begin to take root on newly formed surfaces are pioneer species. These plants serve to temporarily stabilize the new terrestrial surface, protecting it against subsequent erosion by the expansion of their root systems and leaf canopies. Further, they act as constrictions to stream flow, accelerating alluvial deposition in the area of the new land.

As previously mentioned, the process of alluvial land development at this point is continuous. Thus, there is a gradual shift in vegetation that occurs, partially in conjunction with the stabilization of the land surface. Sand bar and beach plant communities, therefore, do not reach a state of normal maturity but are in a state of constant hierarchal and physiological progression.

Pioneer plant species that are typically encountered on sand bars and other new land surfaces include the sand bar willow (Salix interior), black willow (Salix nigra) and cottonwood (Populous deltoides). The willows are usually the first to appear, being more water tolerant than the cottonwood which prefers a better drained environment. The development of dominant plant species within the sand bar community can be summarized as follows (Dicks 1983:426-427):

> [T]he tightly clustered sand-bar willows, once they are established, act as a constriction to water flow and thus enhance the normal rates of deposition. These deposits are usually a mixture of silts and sand and as they accumulate, they tend to elevate the primary land surface. The result is a habitat more conducive to cottonwood, which establishes itself on the higher, best drained areas. Black willow, a more water tolerant plant, will be found on the lower portions of the new land surface, favoring the siltier, poorer drained soils. Given a chance, both Salix nigra and Populous deltoides will grow rapidly and eventually out-shade Salix interior.

Accompanying this willow-cottonwood association are a variety of other plants, including a thick herbaceous level. These will include species that are adapted to sandy soils and periods of submergence during floodstages. Animals are more prevalent on the mature and more stable land surface, but a variety of species may frequent this habitat. The most commonly found animals are amphibians and various reptiles that prefer locations adjacent to aquatic habitats.

Active Levee Environment: This division encompasses the levee structures adjacent to active streams that are receiving seasonal, accretional deposits. The differences between the levee environment and the previously discussed newly formed terrestrial environment are: 1) appreciably less accretional deposition; 2) better drained soils and shorter periods of submergence; and 3) plant community development over a greater period of time in a more stable environment. Otherwise, the biotic constituents of these two environments are fairly similar.

Mature willows, cottonwoods and sycamores (Plantanus occidentalis) are the dominant trees found on levee crests adjacent to rivers and streams. A variety of lesser trees and herbs follow. Particularly conspicuous are the massive cane breaks which are sometimes found in extensive groupings. Once established, these plants grow to considerable heights and numerous references to their presence can be found in the accounts of early explorers and settlers.

A variety of mammals may be found ranging through this environment. The lists include some larger species such as black bear (Ursus americanus), white tailed deer (Odocoileus virginianus) and panther (Felis concolor).

Interfluvial Flats: Interfluvial flats include the often extensive, low-lying level terrain found between drainages and on the back sides of levee systems, facing away from the open water courses. It includes those marginal areas that are subject to episodic, but extensive periods of flooding between the level of permanent lakes and swamps, and the long back slopes of established levees.

Unlike sand bars and newly formed land surfaces that are also frequently inundated, the soil in interfluvial areas is comprised primarily of clay and some silt. Floodwaters that become trapped and retained behind levees and stand for long periods of time, tend to gradually deposit fine clays and silts in a non-dynamic alluvial environment. These clays and silts are not conducive to good drainage, and the result is a distinctly different band of floral development.

Dominant trees found within the interfluvial areas are oaks (Quercus sp.), ash (Fraxinus sp.), elm (Ulnus sp.) and sweetgum (Liquidumbar styraciflua). Except in late summer, after a long dry period, herbaceous plants are conspicuously absent, or few in number, due primarily to the long periods of seasonal inundation, but also because of the shading effect created by the thick canopy of dominant trees.

Non-active Aquatic Environment: As noted earlier, this habitat includes lakes, slow moving bayous and sloughs, swamps, and ponds. These occur as abandoned river channels and cut-offs and in low areas that border on interfluvial flats. Non-active aquatic environments within the lowlands are characteristically complex. They may be divided into two smaller ecotones that are non-exclusive of each other.

The lamnetic community, inhabiting the open, deep areas in lakes is structured by physiochemical conditions that result in a vertical stratification of micro-communities. These conditions are separated primarily by sunlight penetration of the water surface, and changes in water temperatures with increasing depth. Fish are prolific in these areas and were undoubtedly an important food source to prehistoric man, as is testified to by the large number of fish remains recovered from 3CT50.

Along the margins of lakes and bayous are a series of plant species that occupy a thin band created by the seasonal highs and lows in water level. The most prevalent tree types are cypress (Taxodium distichum) and tupelo (Nyssa aquatica). These trees both require the very specialized environment provided by the lake margin for seed regeneration and growth. The peculiar root system of cypress and tupelo trees is an adaptation to this microenvironment. The band which they inhabit demarcates the rather vague boundary between the fully aquatic lake environment and the semi-terrestrial interfluvial environment.

An interesting aspect of the non-active aquatic environment is the seasonal introduction of animal species from active rivers and streams during flooding. This may be accompanied by a temporary disruption of the delicately balanced lamnetic community.

Overall, the variety offered by this environmental division makes it perhaps the most productive in terms of unit biomass, of all the other lowland divisions. In addition to the abundance of aquatic and terrestrial fauna, as well as a variety of flora, the non-active aquatic habitat is a favored environment of migratory waterfowl. This division was undoubtedly heavily relied upon by local aboriginal groups for exploitation by hunting and gathering.

Non-active Levee Crest and Ridges: This division includes elevated terrain such as relic levees and sand ridges that are rarely inundated and contain very well drained soils. Compared to the previously discussed divisions, these areas are inhabited by plant communities that are decisively mesic in their composition.

Dominant tree types include a variety of hardwoods such as hickory (Carya sp.), black oak (Quercus velatina), burr oak (Quercus macrocarpa), black walnut (Juglans nigra), elm and ash. On the lower portions of these ridges more hydrophytic species, such as those hardwoods found in the interfluvial areas, are common.

A large number and variety of mammals are found on these high spots. This concentration of animal species is probably due to the presence of a well developed herbaceous layer, as well as to the security of the levee crests from flooding (Harris 1980).

The Region as a Composite Environment

Although the northeast Arkansas Lowlands are internally diverse, as a composite environmental area they are rather distinct from some adjacent areas. This uniqueness may be viewed as a dichotomy between a major riverine environment, consisting of a broad alluvial floodplain, and surrounding regions which are characteristically upland and, in some areas, mountainous.

An east-west cross-section of the Central Mississippi Valley reveals the Eastern and Western Lowlands that are separated by Crowley's Ridge. To the west, the Valley is bordered by the dissected

escarpment of the Ozark Plateau. East of the Mississippi River are the Loess Hills which constitute the opposite margin of the Central Mississippi Valley (see Figure 1). Each of these broad regions possess characteristically unique environments that may have been important to the prehistoric inhabitants of northeast Arkansas.

As noted above, the western edge of the Central Mississippi Valley is formed by the Ozark escarpment. This is a rugged mountainous region of steep hills and valleys that is accompanied by a very diverse biota. Variations in terrain, parent soils and elevation are abrupt and frequent throughout the region, giving way to diverse floral and faunal associations. Flora ranges from almost xerophytic on the dry, rocky western slopes to hydrophytic in the numerous spring-fed ravines (Steyermark 1959).

Braun (1975) refers to an oak-hickory association that sometimes co-dominates with yellow pine (Pinus echinata) in some of the drier areas. The overall forest composition of this region falls within the Western Mesophytic Forest Division, however, as previously mentioned, a wide diversity in floral composition is exhibited by the Ozarks region.

Crowley's Ridge is an upland erosional remnant that divides the Central Mississippi Valley into east and west halves. This ridge is comprised mostly of Tertiary age gravel deposits which are capped by a mantle of loess. The ridge varies in width and height; in some areas it is elevated 36.5 m (120 ft) above the surrounding lowland terrain, making it a very conspicuous feature.

The soil and drainage features of Crowley's Ridge are very similar to those found in the Loess Hills to the east. Consequently, the floral and faunal association of these two regions are also very similar. Braun (1975:161) provides the following description of the flora on Crowley's Ridge:

> Although far removed from the loess hills on the east side of the Mississippi River, the forest vegetation of Crowley's Ridge is more like that to the east of the Mississippi than that in the Ozark upland to the west. Here is an outlier of the mixed mesophytic forest, so situated that it cannot be included in the Western Mesophytic Forest region, although it is similar to the forest of the western border of that region.

Probably more important than the floral composition of Crowley's Ridge is its geological make-up. The Tertiary gravels that comprise most of the ridge afforded the most readily accessible source of lithic raw material to the prehistoric inhabitants of northeast Arkansas. The importance of this resource is testified to by the abundance of lithic artifacts found on sites in the Lowlands that were fabricated from these gravels.

In sum, the physiographic region which encompasses the project area is a macro-environment that can be holistically perceived, but it is, at the same time, made 'whole' by diverse and spatially distinct micro-settings. The interplay between the macro- and micro-environments has been a focus of archaeological interpretation in attempts to understand the factors influencing prehistoric settlement decisions (Klinger 1978b; Padgett 1978; D. Morse 1975, 1977a; Schiffer 1975a, 1975b; House 1975a).

Archaeologists have gone back and forth over the importance of on-site resources versus off-site resources, cost/benefit ratios of resource procurement, size of a catchment area, and the significance of function in site spacing. On the one hand it can (and has) been argued that settlement decisions were made first on the basis of the overall attractiveness of a macro-environment and then, within this macro-environment, the most favorable micro-settings were selected for. Obversely, there are those who would contend that, for prehistoric peoples in particular, it was the positive environmental attributes of the micro (which became on-site) setting that dictated site placement.

This project was not directed toward an examination of the factors that influenced settlement patterns, but rather towards an examination of how the potentially available on- and off-site resources (or local versus regional) help to explain the cultural behavior of groups occupying 3CT50. The record of that behavior is partially preserved in the subsistence and material remains at the site.

Lithic Resources: A Look at Availability

Within the category of material remains, it appeared at the outset of this work that the analysis of lithics would have to consider raw material procurement since, within the Arkansas Lowlands region, no exploitable sources of stone occur naturally. This means that all lithic artifacts that are found on sites located within the Lowlands, had to have been brought in from other stone producing regions, either directly or through exchange. Below is an overview of lithic raw material which will, in subsequent chapters of this report, be referenced in our interpretations of 3CT50.

Evidence accumulated by previous investigations in the study area indicate that a wide variety of lithic resources were utilized by the prehistoric inhabitants of northeast Arkansas. Emphasis seems to have consistently been placed upon exploiting those lithic resources that are located nearest to, or adjacent to the Lowlands region. There are indications that other, more distant lithic resources, however, were being exploited by different cultures at different times in the past.

The presence of these materials at sites in the Lowlands, to some degree, undoubtedly reflects certain aspects of the structure and organization of these prehistoric cultures. From this perspective alone, it is worthwhile to examine the potentially exploitable lithic

resources available to the prehistoric inhabitants of the study area. Based partially on previously documented evidence, and partially upon measures of the distance between sites located in the Lowlands, and lithic resource areas, we can divide these sources into three primary groups.

First, there are the lithic resources available on Crowley's Ridge. This is the closest area from which suitable raw materials could have been obtained by prehistoric groups located in the Eastern Lowlands. The second, and next nearest source area is the Ozark Escarpment located on the western margin of the Central Mississippi Valley. These two regions represent the primary sources of lithic materials that were utilized by the prehistoric occupants of the Lowlands. Because of its accessibility, the chert gravels located on Crowley's Ridge seem to have been used more extensively by groups in the Eastern Lowlands, while further west, the lithic resources offered by the Ozarks become more important.

The third group includes materials from all other areas that appear on sites in the Eastern Lowlands and that are derived from sources outside of the Central Mississippi Valley. Many of these resources bear special significance because their procurement and utilization seems to be related more to social, idealogical, and political subsystems, than to purely economic factors and technology. Although this is a severely simplified perspective, the overall impression is that the occurrence of materials obtained from the Ozark Escarpment on sites in the Eastern Lowlands can best be explained in simple economic terms.

Crowley's Ridge or Lafayette Gravels: By a direct line, Crowley's Ridge is located approximately 14.2 km (23 mi) due west of site 3CT50 (Figure 10). As previously stated, the Ridge is the closest source of lithic materials to the Little Cypress Bayou site.

Crowley's Ridge is composed of a thick deposit of Tertiary age gravels that is overlaid by a thin mantle of Pleistocene age loess. These gravels are contained within the Lafayette formation: the ridge is heavily dissected by erosion, and gravels are exposed along its slopes and in the stream beds that drain it. The Lafayette gravels are composed primarily of chert but they also contain quartzite. This material varies in quality from excellent to poor. Size of individual gravels is variable but House (1975:82) noted "that specimens with diameters of 15 cm are not uncommon."

Visible identification of Crowley's Ridge chert from archaeological sites in the Lowlands may pose some problems. The presumed parent formations from which the Crowley's Ridge gravels are derived are located in the Ozarks. Morse and Million (1980:15-26) suggest that valid identification of these materials outside of their geological context is difficult, if not impossible "because of this relationship." Since the trace elements that might differentiate

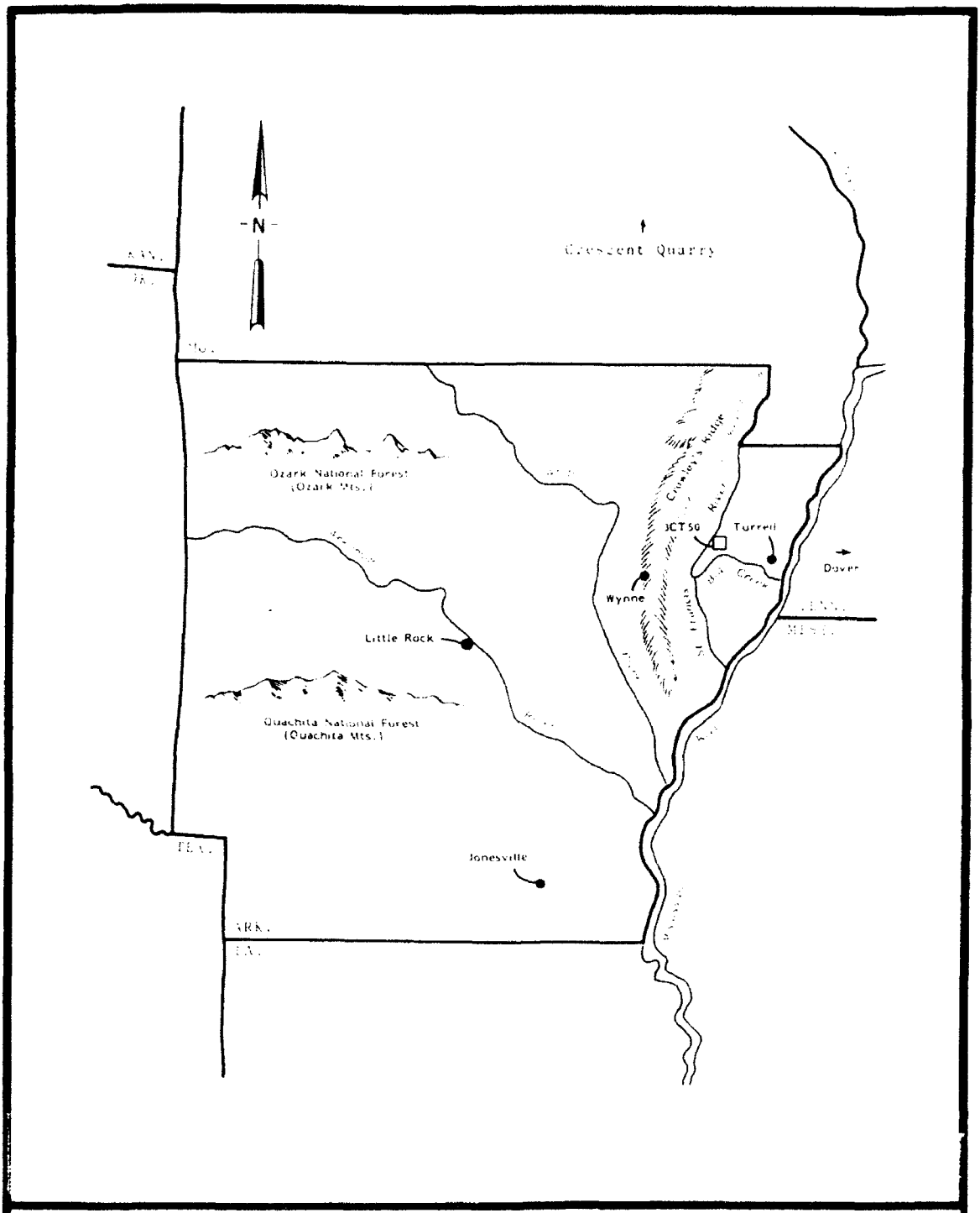

FIGURE 10. LOCATION OF LITHIC RAW MATERIAL SOURCES.

these sources are mostly an in situ development, neutron activation studies would likewise be fruitless in differentiating Crowley's Ridge and Ozark cherts.

Comparative collections made by the senior author that include samples of Lafayette gravel from two points near Jonesville, Arkansas, and one location near Wynne, Arkansas, indicate that a remarkable degree of physical homogeneity are displayed by these materials. Although House (1975a) felt that a considerable amount of variability exists in these materials, it is apparent that these differences are infrequent occurrences.

The vast majority of the material sampled exhibited gross similarities in the color and composition of the cortex and interior. Although a number of colors were observed, most of the chert examined from the Lafayette deposits were a light yellowish brown or tannish brown. Few specimens contained fossils and most exhibited no discolorations, mottlings or banding.

Ozark Escarpment Lithic Resources: A bewildering variety of lithic materials are available in the Ozark Mountains region and plateau of western and central Arkansas. These materials, once in situ, can be observed in cross-sections of geologic strata within the Ozark regions (see Figure 10), but probably the gravel bars located in the streams and rivers that drain this area provide the most readily accessible source locations.

The Ozark lithic resources do not seem to have been as important to the Eastern Lowlands prehistoric groups as the Crowley's Ridge gravels. It is apparent from examinations of collections from sites within the Eastern Lowlands, however, that the utilization and exploitation of these two resources was very different and that these differences varied significantly in terms of both time and space.

Major sources of cryptocrystalline material within the Ozarks include Pitkin and Boone cherts. Pitkin chert is perhaps the most easily identifiable because of its distinctive black color and weathered calcite inclusions (Dicks 1983b; House 1975a; Erwin n.d.). Boone chert is somewhat more variable in its appearance and it is much more difficult to identify when found outside of its geological cortex (Dicks 1983a; Call 1891; Otinger, personal communication). Although generally white or grey, Boone chert may vary in color. Padgett (1973) noted that the main difficulty with this material is that it is very similar to certain other exotic chert types that were traded over long distances, and which show up on sites in the Arkansas Lowlands.

Other chert types that are found within the Arkansas Ozarks include Cotter, Penter, Jefferson City, and Everton. Everton chert seems to have been the most intensively utilized resource of this group as it frequently appears on sites in the Eastern Lowlands. This may, in part, be due, however, to its distinctive appearance which

renders it easily identifiable. Everton chert contains small interclastic inclusions that are visible with the naked eye but are more readily observable under low power magnification (Dicks 1983b). Penter, Jefferson City and Cotter cherts are less frequently observed on sites in the Eastern Lowlands, and seem not to have been as important (Dicks 1983b; Morse and Million 1980; Padgett 1978; and Brooks et al. 1977).

Exotic Lithic Resources: During some periods in the prehistoric past certain lithic resources appear to have been widely acquired primarily through exchange channels, eventually to become deposited at sites located far from their original points of origin. The degree to which certain resources were emphasized, exploited and exchanged varied with different cultures and with time. Studies which are able to both identify the occurrences of "exotic" resources and pinpoint the source of such materials may prove valuable for defining and understanding contact and communications between prehistoric groups. The means by which exotic resources were acquired and then distributed within a culture can also provide indications of social and political structure and organization. The process of acquisition also relates to the economic and subsistence capabilities of a particular culture.

A number of widely traded exotic lithic materials have been identified at sites in northeast Arkansas. These include materials from sources in central Tennessee, southern Illinois, eastern Missouri, and southwest Arkansas (Morse and Million 1980). In the Little Cypress Bayou assemblage, artifacts produced on material from at least three exotic or far-away sources have been tentatively identified. Specimens made from these materials occur only in small numbers, but they include Dover chert, Burlington or Crescent Quarry chert, and Novaculite.

Dover chert is found in the Highland Rim area of central Tennessee. Extensive quarry sites are located in the vicinity of the small town of Dover, Tennessee and it is apparent from these that this lithic material was extensively exploited throughout the prehistoric period (Faulkner and McCollough 1973; Kellberg 1972). Dover chert has been found in association with the Big Lake phase at the Zebree site in Mississippi County, Arkansas (Morse and Million 1980).

Chert from the Burlington Formation, located in eastern Missouri and in southern Illinois, was widely traded throughout portions of the eastern United States. It is also referred to in the literature as Crescent Quarry chert after the massive prehistoric quarry works located south of St. Louis, Missouri (Dicks 1983b; Morse and Million 1980; Ives 1975).

Novaculite was obtained from the Ouachita Mountains region in western Arkansas, and appears to have been greatly desired for its flaking properties after heat treating (Flenniken and Garrison 1975). Artifacts and flaking debris, made from Arkansas novaculite, is often encountered on archaeological sites in northeast Arkansas (House

1975a). A gray colored novaculite, apparently derived from geological context in southern Illinois, has also been identified on sites located within the study area (Harris 1981; Morse and Million 1980). This material has been described, at its source, by Montet-White (1968).

The availability of suitable raw material for lithic manufacture has a direct effect on the range and distribution of environmental resources that were potentially exploitable by occupants at 3CT50. Lacking on-site sources, raw materials had to obtained in one of two ways; trade or procurement forays. The former would have certainly been accompanied by the transfer of information on the raw material sources and the latter would have required the foraging parties physically traverse different environmental zones. In both instances the horizons of Little Cypress Bayou populations would have been expanded to an awareness of the other resources that lay beyond their immediate environs.

Throughout prehistory this cross-cutting of environmental and cultural zones has, in varying degrees, shaped the character and development in temporal periods and local cultures within contemporaneous periods. To understand this articulation of the cultural and environmental spheres in northeastern Arkansas, we can now turn our attention to a review of the prehistoric sequence and the traits, adaptations, and patterns inferred by current researchers.

CULTURAL/HISTORICAL OVERVIEW

The material remains of prehistoric groups representing every major cultural stage recognized in the southeastern United States have been identified on sites located in northeast Arkansas. The following discussion outlines some of the major characteristics of these different stages in order to place the prehistoric occupation of site 3CT50 into regional and temporal perspective.

The Paleo-Indian Stage

While no actual dates on Paleo-Indian remains have been recovered from northeastern Arkansas, this stage is generally considered to date between 12,000 B.P. and 10,000 B.P. The suggested terminal date varies somewhat depending on whether Dalton period remains are considered Paleo-Indian or Archaic. There is debate concerning the temporal position of Dalton within the northeast Arkansas cultural/historical scheme and this seems to arise from attempting to classify a dynamic cultural system into a too rigorously defined analytical structure. Without becoming engrossed in the intricacies of the argument, it is sufficient to say that certain patterns of behavior that are typical of the Paleo-Indian stage continue in the archaeological record as late as 8000 B.P. (Goodyear 1982). These patterns are gradually replaced by adaptive alterations in behavior that are typically considered representative of the succeeding Archaic Stage.

Paleo-Indian sites are found most frequently on the older alluvial terrace deposits in the Western Lowlands. East of Crowley's Ridge, remains of Paleo-Indian become increasingly rarer. This, however, is probably more a product of Central Valley geomorphology than Paleo-Indian settlement systems, as there are fewer surfaces within the Eastern Lowlands that date prior to the Early Holocene period (Saucier 1974).

Paleo-Indian sites are usually identified by the presence of projectile point forms that are typical or reminiscent of those described for the Clovis and Folsom point traditions (Mason 1962). Frequently associated with these diagnostic artifacts are a variety of unifacial tools. Steeply flaked scrapers, small gravers, spokeshaves and blades are also common in Paleo-Indian assemblages.

Paleo-Indian groups appear to have been hunters and gatherers who may have specialized in the exploitation of large Pleistocene megafauna. They were organized into small band-size social units that probably were very mobile, and which covered large territories. Permanent or semi-permanent, habitation sites are not characteristic of these groups.

The Archaic Stage

This stage covers an extended time period from approximately 8000 B.P. to 2500 B.P. As a stage designation, it is perhaps misleading since the Archaic implies a situation of cultural homogeneity that in reality encompassed a number of materially distinct cultures. From an adaptive standpoint, however, the Archaic Stage represents a long series of human responses to an emerging post-Pleistocene environment.

In northeast Arkansas, the changes that take place in the post-Pleistocene period include a major shift in the structure of the riverine environment. This shift entailed a complete and gradual conversion of the Mississippi River from a braided stream system to a meandering one. This shift appears to have taken place between 7000 and 5000 years B.P. (Saucier 1981). While various hypothesis have been developed concerning the impact of this reorientation on environmental change in northeast Arkansas (i.e., Dicks 1983d), considering the relationship between riverine geomorphology, terrain and biota, it is likely that major shifts occurred in the overall Lowlands environment. That these changes in the environment had important influence upon past human behavior, also seems likely.

The Early Archaic period in northeast Arkansas seems to be characterized by a continuation of many traits typical of the preceding Paleo-Indian Stage. Continuity observed in certain material traits seems to be reflected in other aspects of these prehistoric cultures.

"Interestingly, the distribution of Dalton and the distribution of other early [Archaic] point types seems to coincide on a locality

basis" (House 1975a:156). The foundation of this relationship of continuity between Paleo-Indian and Archaic cultures was summarized by Klinger (1978a:16):

> Seasonal settlement shifts seems to become the key to efficient gathering and hunting subsistence activities. As with the Paleo-Indian, the emphasis was probably on gathering (including fishing) with hunting activities serving as a supplement. The band structure still seems to have served as the most visible way in which groups organized themselves.

Throughout the southeastern United States evidence in the form of increasing numbers of sites seems to suggest a steady population increase through the Archaic. Northeast Arkansas, however, seems to represent a departure from this otherwise homogeneous pattern. There are fewer Early Archaic sites than sites and remains dating to the preceding Dalton period (Morse and Morse 1983; Morse 1969). Even more interesting is the virtual absence of identifiable remains dating to the Middle Archaic period. This occurs despite the presence of numerous Middle Archaic remains in areas adjacent to northeast Arkansas. Only in the final Late Archaic period is there an observable increase in site densities and remains commensurable with what is taking place elsewhere in the Southeast.

A number of hypotheses have been offered to explain this pattern of apparent Archaic depopulation of the Central Mississippi Valley region. Morse and Morse (1983) suggest that this phenomenon was related to the Hypsithermal climatic event which is believed to have been characterized by a period of excessive aridity (King 1981; King and Allen 1977). It is also during this time frame (7000-5000 B.P.) that the Mississippi River changed from a braided to a meandering stream system. This change, accompanied by alterations in the overall environment of the Central Valley, may also be related to the shunning of the region. It is apparent, however, that the Early Archaic, and especially the Middle Archaic, are poorly understood in northeast Arkansas. Only intensified efforts directed towards researching these Archaic cultures will eliminate this problem.

The Late Archaic period dates from approximately 5000 to 2500 B.P. This period, although also poorly understood, is better represented in northeast Arkansas than preceding periods. It is characterized by trends toward sedentary settlements and an emphasis upon the maximum exploitation of local resources. Also during this time there is evidence for increasing population, social, and political complexity. Some of this complexity is evident in the more elaborate and extensive sites and material remains of these cultures. Of particular significance is the evidence for widespread interaction between a large number of rather homogeneous cultural groups, and a highly developed social, political and economic phenomenon collectively referred to as the Poverty Point culture (Brain 1971).

Once again, however, in northeast Arkansas there is little evidence for the presence of the complex cultural development associated with Poverty Point elsewhere in the Valley. By Late Archaic times there appears nonetheless to be evidence for social and political structures equatible with a tribal level of organization (Morse and Morse 1983; Brain 1971). This would seem to be related in part to increases in population pressure and trends towards more sedentary settlement systems. The increased emphasis upon local resources may also have been coupled with early horticulture, though as evidence from the southeastern United States suggests, this subsistence mode appears to have been supplemental to a basic continuation of the more prevalent Archaic hunting and gathering.

The Woodland Stage

Following the Late Archaic period, researchers are once again confronted with what appears to have been a population hiatus in northeast Arkansas. While a few sites have been identified that date to the early and middle portions of the Woodland Stage, the patterns of behavior thus far observed in northeast Arkansas do not appear to have paralleled the kinds of cultural developments that were occurring elsewhere within the Mississippi Valley and the southeastern United States in general.

In many parts of the Eastern Woodlands, the Early Woodland period is characterized by a presumed breakdown of the social and political complexity witnessed during the preceding Late Archaic period. Breakdowns notwithstanding, overall the most striking aspect of Early Woodland is manifested in local or regional expression (cf. Brain 1971). At the same time the beginning of the Woodland Stage is marked by an important technological innovation, pottery. The significance of this addition to prehistoric assemblages in the eastern United States has perhaps been overemphasized by previous research; however, its appearance is widespread and rapid, and its occurrence seems to foreshadow major cultural changes to come (cf. Webb 1977). For the most part, however, Early Woodland period cultures were characterized by patterns of behavior that reflect adaptive trends established in the preceding Archaic Stage.

By approximately 1 A.D. substantial changes become evident in the remains of many cultures located throughout the eastern United States. There is evidence for exchange and the spread of elaborate ceremonialism from large mound centers to local regional settlements. This "Hopewell" expansion, which was originally thought to represent a widespread, unifying culture, is now considered to have been a combination of many different cultural traditions, each participating to some degree in the inter-regional exchange of material influence and ideas. Individuals were consolidated into distinct and definable regional cultures rather than into some inter-regional cultural phenomenon as Hopewell was once believed to represent.

The Hopewell tradition appears to have originated north of the central Mississippi River Valley in the Ohio River Valley. In the Lower Mississippi Valley there is the Marksville tradition which appears to be a regional variation of the Hopewellian theme. Between

these two areas, in northeast Arkansas, the absence of material remains observed for the Early Woodland period, continues into the Middle Woodland period. With the exception of a few sporadic occurrences, no remains or sites are found in northeast Arkansas which date to the Middle Woodland period. A notable exception is the Helena Crossing site, which is curiously more like the Hopewellian sites found to the north of the Central Valley, than like Marksville tradition sites which are found in the Lower Valley region (Ford 1963).

Beginning between 300 A.D. and 500 A.D. evidence for a repopulation of northeast Arkansas is apparent. Sites dating to the Late Woodland period become numerous and widespread throughout the Central Mississippi Valley. The cultures that date to this period (ca. 300/400 A.D. to 800 A.D.; Morse and Morse 1983) in the Lower and Central portions of the Valley, are collectively referred to as Baytown. Brain (1971:64), however, points out that within this time period there was a great deal of regional development.

> There was a general overall cultural conformity but it is also clear that people in each region were doing their own thing; this was a time of regionalization and introversion. Each social grouping was operating under the same general set of new rules, but in their own way and without a higher imposed organization.

The Baytown period is unlike the preceding Hopewell and Marksville period, because there appears to be an absence of interregional exchange and communication in Baytown. In northeast Arkansas this regionalization is reflected by the presence of two distinctly different, contemporary phases: the Baytown phase and the Dunklin phase. These phases were originally defined by the distribution of two ceramic traditions, the Baytown grog tempered ceramics tradition and the sand tempered Barnes ceramics (Phillips 1970). There appears, however, to be more to the separation of the Baytown and Dunklin phases than by their respective ceramic assemblages.

The Baytown phase is represented by sites that include small, conical mounds and large village settlements (Brain 1971; Phillips 1970). Some of these sites are associated with extensive midden deposits that suggest "a degree of sedentism consistent with a base settlement or small village (Klinger and Imhoff 1982:109). Trade items and exotic artifacts are sometimes found on Baytown sites that, in conjunction with the presence of mound structures, are ..."possibly suggestive of non-tribal or non sub-tribal ceremonial activity" (Morse 1980:3-11).

The Dunklin phase is characterized by sites which contain a preponderance of sand tempered Barnes ceramics. These sites are generally small and appear to represent isolated hamlets or very small villages. Large villages and mound sites are unknown for the Dunklin phase. Exotic artifacts and large, extensive middens are also not generally characteristic of Dunklin phase sites.

Sites which are associated with the Dunklin phase are concentrated in the Bootheel of Missouri and in that portion of northeast Arkansas that is characterized by Pleistocene-age braided stream terrace deposits. Baytown phase sites, on the other hand, are more widespread occurring to the north, south and east of the Dunklin phase zone area, primarily on surfaces characterized by braided stream deposits (Smith 1978; Phillips 1970; Morse 1969, 1980).

Morse (1977b, 1980) suggests that the differences between Baytown and Dunklin are the result of differences in their social and political structures. Baytown is thought to have had a centralized tribal organization, involved in inter-tribal exchange and communication. The Dunklin phase, however, represents the remains of a segmentary tribe loosely held together into a series of isolated and basically autonomous hamlets and villages. The former Baytown phase culture may have been characterized by a greater dependance on agriculture (Klinger et al. 1984), while the Dunklin phase people were probably still primarily dependant upon hunting and gathering.

The Mississippian Stage

The Mississippian Stage in northeast Arkansas is marked by substantial changes in social and political complexity, subsistence and settlement, and material remains. While these changes over the preceding Baytown, or Late Woodland period, do not appear to have been entirely abrupt, there is some debate over whether Mississippian development in northeast Arkansas was primarily an internal phenomenon, or the result of intrusion and diffusion from the Mississippian core area located in Illinois.

Generally, the Mississippian Stage is characterized by the appearance of shell tempered ceramics, large flat-topped mounds, villages, highly centralized political and social organizations. The subsistence base appears to have been largely agricultural with the combination of beans, squash and corn forming an essential dietary triad. Hunting and gathering continued to be important, but intensive agriculture played an important role in allowing populations to become more concentrated. It also was critical for the support of groups of individuals that were not directly involved in food production, but were instead producing crafts and non-food items.

The Early Mississippian period is marked by sites at which there is an overlapping of traits typical of both Mississippian and Late Woodland cultures. A number of phases have been identified in northeast Arkansas that are characterized by this merging of traits and that fall within the 800 A.D. to 1000 A.D. time range. The best known of these is the Big Lake phase which is concentrated in extreme northeast Arkansas and southeast Missouri (Morse 1980).

Morse (1977b:186, 1980) suggests that the merging of Early Mississippian and Baytown traits at Big Lake phase sites, such as Zebree, are the result of the migration of a centralized chiefdom into northeast Arkansas.

> Sometime around A.D. 900-1000 a Mississippian chiefdom migrated into extreme northeast Arkansas. Its ultimate roots appears to be in the Fairmount Phase at Cohokia... The migration meant an intrusion of a strongly structural chiefdom into an area consisting of a weakly structured segmentary tribe. The indigenous population reacted by amalgamation with or acculturation to the dominant society. The ultimate result was a third society patterned after a central Mississippi Valley chiefdom.

Other researchers feel, however, that while some traits characteristic of the Mississippian Stage may have spread by trade and diffusion from core areas such as Cohokia, Illinois, the overall Mississippian pattern was the result of indigenous development out of the local Late Woodland cultures in the Mississippi Valley (Brain 1971).

Despite its origins, Mississippian culture was firmly established in the Central Mississippi Valley by approximately 1000 A.D. Unlike the earlier manifestations of Mississippian culture in northeast Arkansas, in which the settlement pattern consisted of dispersed Mississippian farmsteads and villages, sometimes associated with small mound complexes, the Middle Mississippian period appears more complex. Large sites are dispersed around civic-ceremonial centers, and these, in turn, are centrally located to numerous dispersed hamlets. The large civic-ceremonial centers appear to have been individual points of consolidation for a number of Mississippi chiefdoms that flourished ir northeast Arkansas between 1000 A.D. and 1400 A.D. (Morse and Morse 1983).

Evidence for trade and exchange between chiefdoms and groups in adjacent regions is visible in the wealth of exotic material remains and widespread decorative and religious motifs that occur on sites of this time period.

By 1350 A.D. to 1400 A.D., major shifts in population are evident in northeast Arkansas. There is movement away from the braided stream surfaces in the Lowlands regions to deposits associated with meandering streams. Populations become more nucleated and the intervening areas between these concentrations become uninhabited and only intermittently exploited. Morse and Morse (1983:283) described this reorientation in population distribution and site location:

> The Central Valley population was nucleated not only into specific areas but also, for the most part, into fortified villages or towns, representing a complete break with the previous pattern of farmsteads dispersed around a civic-ceremonial center. It would seem obvious that the population was nucleated for protection.

One explanation for the changes observed for the Late Mississippian period is related to the agricultural productivity of

braided stream deposits and meander belt deposits. Morse and Morse (1983) believe the former to be less productive than the latter, and that braided stream areas, therefore, were incapable of supporting the concentration of individuals that were present during the Middle to Late Mississippian periods. Competition for the more productive lands offered by the meander belt deposits would have created even greater nucleation of Mississippian populations (Morse and Morse 1983; P. Morse 1981).

Much of what is known of the interior southeastern United States Mississippian cultures comes from the observations and accounts of the DeSoto expedition. In 1541 DeSoto and his entourage of guides, soldiers, horses and pigs crossed the Mississippi River and entered into northeast Arkansas. There they encountered the worst swamps in all of what was then called Florida (P. Morse 1981). They also made contact with a number of large Mississippian chiefdoms, though some debate exists over exactly where these were located and what routes DeSoto and his expedition followed (P. Morse 1981; Phillips et al. 1951). Although the exchange between the Spanish and Mississippian populations was very brief the results of this contact was to have a lasting and devastating affect on the indigenous population. By the time the French arrived in the Central Mississippi Valley in the late 17th century, the Mississippian society observed by the Spanish was no longer in existence. European diseases and other factors had reduced most of the Mississippian chiefdoms to isolated, segmentary tribes and only a fraction of the original population remained in northeast Arkansas.

CHAPTER THREE

RESEARCH DESIGN

The Little Cypress Bayou site lies at the confluence of two minor streams, Big Creek and a tributary, Little Cypress Bayou. Remains of prehistoric occupation are found on the adjacent crest and slope of an abandoned Mississippi River levee and are evidenced by surface artifacts, hundreds of subsurface features, and midden deposits.

If the geographic location of 3CT50 was left out of the above paragraph, the brief setting description could easily fit any of a number of sites throughout the Central Mississippi Valley. Small dispersed hamlets in similar settings are ubiquitous in this region, and, as Iroquois (1979) suggested for one of the occupations at 3CT50, many of them date to the Baytown period.

Although we may be jumping ahead of ourselves at the moment, the data recovery at 3CT50 clearly demonstrated that the strongest and most abundant evidence of occupation is dated to the Baytown period. While there are materials from other periods in prehistory, the Baytown remains predominate and the research issues that were originally proposed to guide investigation of the site focussed heavily on this period.

In the following discussions, the Baytown period is examined in terms of chronology, settlement and subsistence; however, issues dealing with the temporal and cultural relationship of Baytown to both earlier and later occupations of the Central Valley are also explored. The issues related to Baytown occupations and temporal relationships provided a framework through which excavations were carried out. The extent to which the data from 3CT50 could be used to advance these issues is evaluated in the remaining chapters of this report.

THE BAYTOWN PERIOD

Cultures attributed to the Late Woodland period in the central portion of the Lower Mississippi Alluvial Valley are all generally grouped under the rubric Baytown period. Although the range of dates tend to vary somewhat from region to region, the Baytown period is usually placed between approximately A.D. 400 and 800 (Morse and Morse 1983; Phillips 1970). As a concept, Baytown represents a collective category of prehistoric cultures that practiced similar lifeways and produced comparable material items (Brain 1971; Phillips 1970). Support for this broad impression of homogeneity is usually drawn from the ceramic assemblages recovered from Baytown sites since the pottery of this period generally displays remarkable uniformity.

The ceramic types associated with Baytown occupations may seem mundane and rather uniformly functional, in comparison with types and varieties of the preceding Marksville period and subsequent Mississippian Stage. That characterization of Baytown pottery, coupled with what has been broadly perceived as cultural homogeneity has led some archaeologists to suggest these groups witnessed a decrease in societal complexity from the preceding period (Phillips 1970; Griffin 1960). Others, such as Brain (1971) demur, interpreting the remains instead as a sign of societal retrenchment that laid the foundation for the even more complex society that was to follow.

Regardless of which viewpoint one accepts, both underscore an interesting aspect of Baytown--its stark variance from periods preceding it or following it in time (Schiffer and House 1975; Brain 1971; Phillips 1970; Morse 1969, 1977b, 1980; Phillips et al. 1951). In reviewing theories which have attempted to explain such Baytown variance, the most appropriate place to start is with the hallmark of the period, the ceramics.

Baytown Chronology and Phases

Within the Baytown period numerous phases have been defined based on assemblage variability. The initial establishment of individual phases was accomplished primarily by Phillips et al. (1951) and Phillips (1970). The well respected achievements of Phillips et al. (1951) were derived primarily from their seriation of ceramic assemblages; the results of their studies have held sway over archaeological interpretations of Baytown to the present day even though some of their points have been challenged and more recent investigations may call for some revision in the ceramic sequence.

In the Central Mississippi Valley, Baytown is divided into the Dunklin, Hoecake, and Baytown phases (Phillips 1970). The Dunklin phase seems to be represented by the distinctive Barnes ceramic tradition that is characterized by sand tempered pottery and is restricted to the northeast corner of Arkansas and the southeast corner of Missouri. In contrast, the Baytown and Hoecake phases are defined primarily by quantitative type variations within a single ceramic tradition.

Hoecake ceramic assemblages are characterized by a predominance of Mulberry Creek Cordmarked pottery followed in frequency by Baytown Plain (Phillips 1970; Williams 1954). Baytown phase assemblages are generally noted for a lack of cordmarked sherds, although there are many exceptions to this statement. Basically, the distinction comes down to location; Hoecake phase sites are restricted to the Cairo or Little River Lowlands, while Baytown phase sites are located further south.

Besides ceramics, however, the cultural assemblages of these Baytown period phases are not well known. The number of lithics, worked bone and other cultural materials recovered even from large-scale excavations at Baytown period sites has not, as a rule, been very impressive. Consequently, it is hardly surprising that archaeological debate concerning this period in the Woodland Stage has traditionally focussed almost exclusively on ceramics.

One of the most troublesome of the unresolved problems in the Central Mississippi Valley is the relationship between the Baytown and Coles Creek periods. In the Lower Mississippi Valley, Coles Creek is a separate, definable cultural unit that succeeds Baytown in time. However, further north the Coles Creek ceramic markers, so omnipresent in the south, are generally absent. As Phillips (1970:902) states:

> In the south, the end of Baytown is clearly marked by the appearance of Coles Creek types. The alteration of Coles Creek complexes from about the latitude of Greenville north makes it necessary to fall back on such criteria as low frequencies of Mulberry Creek Cordmarked, the appearance of Wheeler Check Stamped (which only works in certain regions) and 'Baytown Plain with Coles Creek characteristics'...None of these criteria is without its problems.

From an archaeologist's perception the absence of Coles Creek ceramic markers implies that the Baytown culture evolved directly into or was replaced by Mississippian groups. Further, it has appeared that Baytown not only lasted longer in the Central Valley than in the heartland of the Coles Creek tradition, but it also appears to have been relatively unaffected by developments of that southern tradition.

However, for a variety of reasons, many archaeologists have been uncomfortable with this assessment of Baytown-Coles Creek relations. Some researchers (Brain 1971; Phillips 1970:912-914; Phillips et al. 1951:443) find it difficult to understand, much less explain, the rise of the Mississippian tradition in the Central Valley in the absence of some type of evolutionary progression. This view is easily appreciated in light of the cultural developments and transitions in the Lower Valley (Marksville to Baytown to Coles Creek to Mississippian).

Not all archaeologists who have worked in the Central Valley, however, see the absence of Coles Creek manifestations as a stumbling

block to interpretations of the Baytown/Mississippian transition. For example, Morse (1977b), and Morse and Morse (1980, 1983) have argued that the absence of a clear transition between Baytown and Mississippian in the Central Valley is indicative of external, rather than internal, cultural development. Baytown society is hypothesized to have been replaced, through amalgamation and acculturation by emergent, but already developed Mississippian groups who were migrating into the Central Valley region from the Mississippian core area in southern Illinois.

The real problem here is one of archaeological constructs. As we pointed out earlier, at best the broad concept of Baytown encompasses a set of sites which share a similar ceramic assemblage; this concept likewise implies general cultural ties. However, the use of Baytown as a cultural construct has been much less successful than its use as a temporal marker. Part of this situation stems from a general dearth of data. A much more fundamental problem is the fact that, unlike the societies that came before and after, Baytown groups consisted primarily of small, semi-autonomous units that were at most loosely linked together. Across the board, such Baytown sites, of which 3CT50 is an example, do not display a strong sense of cultural homogeneity and it is further quite likely that the level of cultural complexity and the rate of culture change varied considerably over the hundreds of years the period spanned.

This perspective of Baytown is essentially the same as the view that Brain (1971:64) advocates. Baytown is interpreted as a period of regionalization and introversion. Cultures were, in effect, "doing their own thing," and it is therefore somewhat misleading to speak of all Baytown cultures, in the literal sense, as a singular entity.

As far as the Central Valley is concerned the major task facing archaeologists is to determine the nature of local Baytown societies and the direction of internal cultural development. Rather than presupposing a gradual cultural evolution (by holding onto the concept of a Coles Creek occupation) or a cultural truncation (by an encroaching Mississippian society) we must delineate what "Baytown" means in the Central Valley and the most likely course these societies followed.

The obvious and probably most appropriate means of achieving this end is the development of a more refined chronology. Traditionally, Baytown grog tempered ceramics have been seen as giving way to Mississippian shell tempered ceramics. While archaeologically in tune with shell tempering as a Mississippian marker throughout the Southeast, this progression from grog to shell may not be entirely accurate for the Central Valley.

Archaeologists have for some time recognized a mixed grog and shell tempered ceramic ware, but it has too often been either ignored (Phillips 1970) or, because of the presence of shell, pigeon-holed into the Early Mississippian period along with other shell tempered ceramics (Morse and Morse 1983).

It has been suggested that these grog/shell tempered ceramics may have temporal significance. Klinger's (1983) data from the Brougham Lake site (3CT98), located 12.8 km (8 mi) downstream from 3CT50 (Figure 11) indicates that the grog/shell temper can be securely dated to the Late Baytown-Early Mississippian transition period and clearly predate other shell tempered wares. The importance of Klinger's claims cannot be overemphasized and much of the ceramic analysis at the Little Cypress Bayou site has focused on this issue.

In addition to the temporal indications of Klinger's (1983) ceramic interpretations, a firm placement of mixed grog and shell tempered sherds as a transition type could also give rise to revised interpretations of settlement and subsistence. It is to these broad issues that we now turn our attention.

Baytown Settlement

Late Woodland settlement patterns in the Lower Mississippi Alluvial Valley have generally been described as reflecting a "dispersed" distribution of population over the existing landscape (Morse 1980; House 1975; Schiffer and House 1975; Brain 1971). This impression of widespread, minor groupings becomes particularly evident when viewed against the background of a strongly centralized and cohesive population characteristic of the preceding Middle Woodland and succeeding Mississippian stages. While this dispersed pattern of Baytown period settlement seems to describe adequately the overall picture of population distribution in the Central Valley during this time, it is also apparent that regional differences existed.

The Baytown phase pattern of settlement was first interpreted by Phillips et al. (1951) and later expanded by Phillips (1970). These researchers noted that there was an association of small conical mound complexes with rather small habitation sites. At the time of the original Lower Mississippi Valley survey none of the purported Baytown phase mounds had been excavated and the cultural affiliations were based solely on surface material.

Data available today from investigation of Baytown sites underscore a pattern of habitation sites tending to be located on the higher levees and ridges associated with relict stream channels and oxbows. There is little indication that the interfluvial areas between these ridges are being used as habitation loci (Klinger and Imhoff 1982; Iroquois 1979; Klinger 1978b; G. Smith 1978; Million 1977; Toney 1977; Schiffer and House 1975; Williams 1956). This latter observation, however, may be biased by the higher probability that sites within this portion of the riverine landscape could be buried by backwater alluvium and, therefore, ordinarily beyond the detection of surface reconnaissance surveys.

Beyond the fact that there are small Baytown phase mound sites and small habitation sites, little is known of their internal structure, their relationships to each other, and whether additional site categories are recognizable within the existing samples. From what little

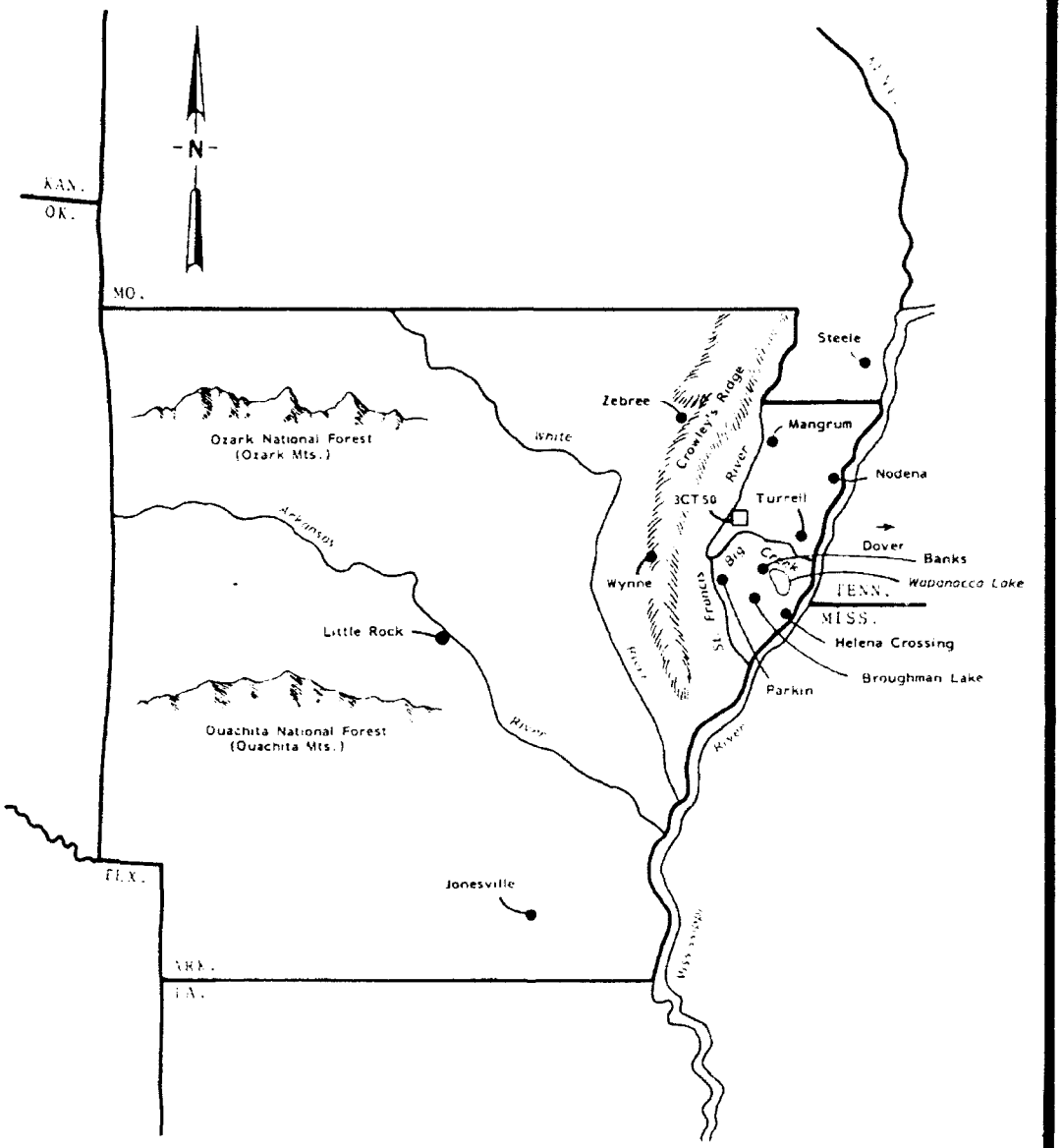

FIGURE 11. LOCATION OF BAYTOWN PERIOD AND OTHER SITES IN RELATION TO 3CT50.

information is available, it would appear that most habitation sites represent occupations by small social groups and that they are probably comparable to current concepts of isolated hamlets and small villages (Klinger et al. 1983; Morse and Morse 1983; Morse 1980). Whether these were seasonally occupied or represent permanent settlements is a question that remains to be answered. One characteristic of these sites, however, is that they are often associated with fairly extensive midden deposits and subsurface features (Klinger and Imhoff 1982; House 1975). This seems to indicate rather intensive use or reuse of the same location.

An additional question along these lines concerns the relationship between individual sites and the small mound "centers." Most investigators (Morse 1975, 1980; Phillips 1970) view the mounds as indicative of some type of socio-religious authority that linked together dispersed villages in a limited area. The nature of this authority is virtually unknown.

In 1960, Perino (1967) excavated at Banks Mound 3 near Wapanocca Lake, about 4.8 km (3 mi) upstream from the Little Cypress Bayou site (see Figure 11). Banks Mound 3 consisted of a large Mississippian mound that had been constructed over a smaller Baytown mound. The Baytown mound was a small circular structure approximately 12.1 m (40 ft) in diameter and 60 cm (24 in) in height. Twenty-eight burials were affiliated with the Baytown mound. Perino (1966) also claimed that two other similar mounds nearby, Banks Mound 1 and Banks Mound 2, were of Baytown derivation. Excavations by Morse (personal communication) at the Cherry Valley Mounds site have since indicated that one of the mounds that was once thought to be Baytown is actually of Mississippian origin. Morse (1980:341) notes however, "There are Baytown mound sites and exotic artifacts possibly suggestive of pan-tribal or pan sub-tribal ceremonial activity."

From the Banks site we do know that these mounds often contained a number of burials (Perino 1966, 1967). This situation contrasts strongly with habitation sites in the surrounding Big Creek area from which only a few burials have been recovered. However, at habitation sites along Big Creek, elongated pits similar to those which contain burials, but which are sterile, have been found. Given the proportion of secondary bundle burials at Banks (53.5 percent) it is quite possible that many of the skeletons were first interred at the habitation sites and then moved to the mound at a later date.

If this scenario is correct, it raises more questions than it answers. For instance, why are some burials moved and not others? Are there status, sex, and/or age criteria involved? Besides mortuary practices, how else was the central socio-political authority manifested? What do these practices imply for understanding intersite relations and settlement patterning?

Much less is known about Hoecake and Dunklin phase settlement than the Baytown phase; Hoecake phase settlement appears to be very similar

to Baytown. Mound sites, like La Plant (Marshall 1965; Griffin and Spaulding 1951), have been associated with the Hoecake phase, as have many dispersed habitation sites.

Dunklin settlement, however, seems to be different from Baytown or Hoecake. The sites tend to be smaller and the extensive midden deposits often associated with Baytown sites are absent. These characteristics, coupled with a paucity of features and lack of evidence for permanent facilities, such as storage pits and structural remains, may suggest that Dunklin sites were seasonally occupied. Morse and Morse (1983) suggest that many of these sites are the product of isolated houses which were inhabited by single, extended families. Aggregation into larger tribal units may have occurred at larger sites during certain times of the year. No mounds have been identified in association with Dunklin phase remains, and in contrast to Baytown and Hoecake, this may indicate lesser degrees of societal integration and cohesion (Morse 1977).

At the present time our first priority is to identify the full range of Baytown period sites in the Central Valley. Once completed we can then work out the relationships between the site types and develop a settlement system. Concomitant with this work is the need for subsistence related data from the full range of site types. This information will allow us to evaluate factors of site location, the seasonal round, and the economic relations between site types.

Subsistence

Subsistence adaptation and subsistence change constitutes an integral research objective in the study of Central Mississippi Valley prehistoric cultures. However, with the exception of Mississippian culture, very little direct evidence is currently available on this aspect of prehistoric cultural adaptation. This gap in the archaeological data base seems to be due primarily to the quality of preservation at many prehistoric sites in northeast Arkansas; increasingly sophisticated recovery techniques being utilized on both testing and data recovery projects may gradually alleviate some of the problem, however.

A number of models have been proposed that examine the nature and causes of subsistence change in the Central Mississippian Valley. While ultimately concerned with settlement behavior, Klinger (1978b) has proposed a general model of prehistoric subsistence change in which he visualizes a "gathering-fishing-hunting" (GHF) subsistence strategy which ultimately develops into an "agriculture-gathering-fishing-hunting" (AGFH) subsistence strategy, with agriculture in the latter model taking primacy over the other strategies. The implication of this model is that through time, prehistoric subsistence shifted gradually from being primarily extractive, in terms of the natural environment, to exploitative.

It is now generally accepted that the beginnings of plant cultivation took place in the Late Archaic period in the eastern United States

(Yarnell 1976b). Direct evidence from the Central Mississippi Valley of this subsistence mode is lacking. It is, however, probable that some form of horticulture constituted at least a minor supplement to the typical GHF Archaic pattern (Morse and Morse 1983:143; Schiffer and House 1975:169; Morse 1975:191-192). Based on Klinger's (1978) model, it is asserted that cultivation became increasingly important, and that it eventually superseded all other strategies as the primary subsistence resource.

There is a substantial gap in the archaeological record in northeast Arkansas between the end of the Late Archaic and the early Late Woodland period (Morse 1969). Elsewhere, subsistence data is conflicting and this conflict extends primarily to an evaluation of the role that agriculture played in the subsistence strategies of Early and Middle Woodland cultures.

Griffin (1960) suggests that maize agriculture had become a highly intensified form of food resource production and that this subsistence mode was, in part, responsible for the Middle Woodland Hopewell cultural florescence. Others (Morse and Morse 1983:143, 164; Cleland 1976; Brain 1971), contend that while cultivation continued to be increasingly important in the diet, it did not assume the primacy advocated by Griffin. Brain (1971:57-58) suggests that subsistence in the Yazoo Basin was characterized by "an economic refinement, viz., an increased dependance upon horticulture of native plants, such as sunflower, marsh elder, and perhaps others, to supplement the basic diet."

If, however, Griffin (1960) is correct in his postulation that a relationship exists between the development of Hopewellian cultures, and the intensification of maize agriculture, then the absence of Middle Woodland Hopewell sites in northeast Arkansas, may be related to a continuation of a basic GHFA subsistence strategy in which horticulture is only marginally supplemental to the overall subsistence base. Unfortunately, the only good example of a Hopewellian site in northeast Arkansas is the Helena Crossing site which was excavated prior to the advent of modern subsistence recovery techniques (Ford 1963). Excavation at Helena Crossing was concentrated in burial mounds, and associated habitation areas where more appropriate subsistence data might have been retrieved, were not intensively examined or located (Ford 1963).

Baytown subsistence data has only recently come to light with the intensive excavation of a number of Late Woodland sites in northeast Arkansas. As is often the case with newly assimilated data, while broadening the archaeological data base, it has also fed controversy into the debate over Late Woodland subsistence behavior.

In northeast Arkansas subsistence data on Baytown has been produced for both the Dunklin and Baytown phases, which Morse (1977b, 1980) believes to be roughly contemporaneous. Most of the data on the Dunklin phase is derived from the excavation of the Zebree site (3MS520; Morse and Morse 1980) (see Figure 11 for site locations).

Several other Dunklin sites, including the Steele site (Brockington and Dicks n.d.), DeRossitt (Spears 1978) and Mangrum (Klinger 1982), have been extensively excavated but yielded very little subsistence information, due to the poor quality of preservation.

Based on the Zebree site data it would appear that the Dunklin phase populations were primarily hunters and gatherers, dependant upon the exploitation of terrestrial fauna and flora. Despite a potential wet environment, aquatic resources and, in particular, water fowl, do not appear to have been significant food sources (Morse and Morse 1980). In this respect, Dunklin subsistence behavior is very similar to the pattern described for the Baytown phase below. Evidence suggest that these two phases deviate in terms of subsistence behavior, with regard to the extent of their respective reliance upon cultivated resources.

Evidence for significant horticulture associated with Dunklin phase subsistence is very scant. Morse (1980:17-12) noted a questionable association between Barnes tradition ceramics and maize at Zebree. The variety of maize that was present is not stated, and no whole cobs were present from which average row numbers could be computed to ascertain whether this association was accurate or not (see Cutler and Blake 1973:6).

In summary, the evidence from Zebree suggests a GHFA subsistence strategy for the Dunklin phase with gathering, hunting and fishing being supplemented by the cultivation of sunflower (Helianthis) and chenopodium (Chenopodiaceae) (Morse 1980). This pattern is marginally supported by evidence from Mangrum where Klinger (1982:129) suggest that Dunklin phase subsistence at both Zebree and Mangrum was "dominated primarily by gathering wild flora foodstuffs, and followed by fishing, hunting and gardening."

Based upon evidence gathered from the Brougham Lake site (Klinger et al. 1983) a model of subsistence adaptation and subsistence change has been proposed for local Baytown and Mississippian cultures. The Brougham Lake site data suggests that Baytown groups were primarily dependant upon the hunting and gathering of terrestrial resources associated with the Lowland levee and ridge environment. Correspondingly, data suggests that cultivation of North American variety maize, cucurbit and other native flora constituted an important food source.

Aquatic resources, such as those found in backwater areas, do not appear to have been extremely important in the Baytown diet, and may only have been seasonally exploited as they became available or reached peak productivity. This is supported by evidence obtained from the Berry Cemetery site (Klinger et al. 1983:159). As Klinger et al. (1983:461) suggest

> In general, floral remains recovered from the Baytown features indicate that these people gained the vast bulk of their vegetable diet from cultivated sources.

In contrast, evidence recovered from Mississippian contexts at Brougham Lake indicates that the subsistence base became more diffuse through time and that it witnessed a shift in emphasis from the hunting and gathering of terrestrial levee resources, to the extensive exploitation of aquatic resources. This shift is hypothesized to have resulted from the depletion of natural levee resources through the incorporation of levee terrain into cultivated fields in the vicinity of Mississippian sites. More accessible (nearby) aquatic resources therefore became gradually more important and the evidence seems to bear out the contention that the Mississippian period witnessed a substantial increase in the exploitation and utilization of aquatic resources and in particular, fish (Springer 1980; B. Smith 1975, 1978; Bogan 1974). The importance of backwater fish as a subsistence resource to the Mississippian populations at Cahokia has been demonstrated by Yerkes (1973) who has also recently explored the potential seasonal availability of this resource (Yerkes 1981).

P. Morse (1981) suggested that reduction in local deer populations may have occurred during the Mississippian period through the expansion of agricultural lands around some of the larger sites such as Parkin and Nodena. She felt that this trend should be evident in the skeletal populations through evidence for a limited red meat diet in all elite individuals who might have had more direct access to such a scarce resource. Although such a pattern is supported by evidence gathered from the analysis of skeletal remains from Zebree (Powell 1980), such evidence is not available for Brougham Lake due to the absence of a preserved burial population. Klinger et al. (1983), however, feel that the Mississippian population at Brougham Lake was small enough to be supported by cultivation without greatly affecting the availability of local levee resources such as the white tail deer.

The subsistence pattern proposed for Brougham Lake appears to deviate from the general Late Focal-Diffuse subsistence model proposed by Cleland (1976). In this evolutionary scheme of subsistence change, Late Woodland cultures, in general, are hypothesized to have been trending away from the diversified subsistence base, exemplified by the preceding Late Archaic and early Middle Woodland diffuse pattern. This latter pattern was dependant upon the exploitation of a wide range of natural resources and was supplemented by the cultivation of various flora, probably beginning in the Late Archaic period (Yarnell 1976).

By the end of the Middle Woodland period, Cleland (1976) suggests that evidence for the horticultural manipulation of a wide range of plant species was being replaced by a highly selective process based upon the production of food resources from a limited number of cultigens. In the Mississippian Stage, this pattern involved high labor investments directed towards the production of maximum agricultural yields in a limited range of cultigens. This shift occurred at the expense of a broader and more stable, but less efficient and predictable resource base.

The Brougham Lake evidence implies, however, that Late Woodland subsistence pattern represents the apex of a late focal economy, and that the ensuing Mississippian occupation operated on a broader subsistence base. Klinger et al. (1983:473) even suggest that the Baytown dependance on cultivated resources may have produced stress pathologies including "vitamin B deficiency, cheilosis, pellagra and the growth arrest in the young during the 'hungry season' due to excessive dependance on carbohydrates." Likewise, an increase in the diversity of the resource base during Mississippian times is advocated by Asch et al. (1972) who hypothesized that diversification of the resource base should occur through time as a result of population pressures.

Robinson (1982) further proposes that focal changes in the Mississippian exploitation of fauna, proposed by Cleland (1976) as resulting from the intensification of agricultural production, did not occur. Instead, Robinson (1982:71) notes that "the evidence gathered thus far points to the fact that Mississippian hunting patterns were a continuation of those practiced by earlier groups." Similarly, Muller (1978:307) suggests that Mississippian subsistence can be characterized as a "mixed economy" in which the gathering of wild plant foods continued to be an important food resource.

Evidence obtained from some large Mississippian sites, such as Parkin (P. Morse 1981) and Nodena (Blake and Cutler 1979) indicate that maize, bean and squash did constitute a substantial portion of the Mississippian diet. It may, therefore, be impossible to distinctly characterize Mississippian subsistence economies as either focal, or diffuse. At larger sites, concentrated populations may have required subsistence modes which emphasized intensive cultivation in order to sustain numbers of individuals that would have closely approached, or been beyond the carrying capacity of a mixed hunter-gatherer-agricultural based economy. Smaller habitation sites, characterized by less concentrated populations, may have operated on a somewhat more diffuse resource base. While B. Smith's (1975, 1978) overall pattern of Mississippian adaptation and exploitation of the riverine environment may hold true, a singular characterization of Mississippian subsistence behavior may not.

B. Smith, in a series of works (1974, 1975, 1978) has redefined Mississippian culture on the basis of a hypothesized settlement pattern that emphasized the exploitation of rich riverine environments. Smith (1978:481) suggests that the emphasis of Mississippian settlement on the Eastern floodplain environment

> was a function of the specific, complex adaptation by Mississippian populations to this habitat zone composed of linear bands of circumscribed agricultural land and concentrated biotic resources.

A similar model of Mississippian subsistence adaptation was proposed by Lewis (1974).

Smith (1975:167) also felt that this pattern probably emerged in the Central Valley region prior to the Mississippian period. This is supported by Brain (1971:67) who may actually have first stated the above subsistence pattern with reference to Late Woodland cultures in the Lower Mississippian Valley:

> The economic base had just been established in the previous period [Late Woodland], and so with only minor refinements it appears to continue unchanged throughout this period [Early Mississippian] in the south. Its success is indicated by a definite increase in population as Aden peoples moved to exploit the rich levees of every stream they could find [Belmont 1967]; especially favored were old cut-offs and inactive channels, rather than active river channels, which are more limited ecological riches.

A few kilometers east of the Little Cypress Bayou site is the Banks site, which occupies an inactive levee crest that overlooks a meander cut-off of the Mississippi River. With reference to this site Smith (1975:167) noted,

> I think that the Banks Site, and perhaps many other meander belt Middle Mississippi sites, were established in oxbow lake areas quite soon after they were formed by shifts in the meander pattern of the river, and that the establishment of these sites represented expansion into newly formed, unexploited niche areas.

Smith correlated the Mississippian component at the Banks site with a date of 1365 A.D. provided by Fisk for the formation of the adjacent meander cut-off. Problems with Fisk's (1944) chronology, however, have been pointed out (Saucier 1974), and the presence of an earlier Baytown component at this same location (Perino 1966, 1967) suggests that the Mississippian pattern devised by Smith (1978) may actually begin to occur even earlier in the Central Mississippi Valley. This is, in fact, postulated by Smith (1975:139), particularly in reference to the exploitation of fauna contained within the meander belt system. Spears (1978:88-89) also notes that the Baytown occupation at DeRossitt fits Smith's (1974) model of meander belt adaptation.

A critical question, then, is when did the "typical" Mississippian pattern of subsistence and adaptation arise and what are the implications of this development in terms of cultural change and development. If, as Smith (1978) suggests, the Mississippian orientation towards riverine environments emerged in the lower and central portions of the Mississippi Valley, then there is less support for Morse's (1977, 1980) hypothesis that Mississippian culture, and presumably the Mississippian pattern of subsistence, were the result of migration from the Upper Valley regions. Instead, as Brain (1971:65) strongly suggests, the basic exploitative pattern evident in the Mississippian

period, was already developed in the preceding Late Woodland period, thereby establishing "a solid foundation for the events yet to come."

Temporal Relationships of Baytown to Other Periods

Marksville to Baytown: Cultural Evolution or De-evolution

One of the most difficult problems encountered by any archaeologist is explaining how and why an apparently successful complex cultural phenomena became transformed into what seems to be a less complex cultural entity. Mississippi Valley archaeologists face such a situation when they try to account for the transition from the Middle Woodland Marksville period to the Late Woodland Baytown period.

The material assemblage of the Marksville period is characterized by elaborately decorated ceramic vessels, the presence of exotic, non-local trade items, large-scale earthworks and mounds, and an intricate burial complex. Baytown cultures pale by comparison. The Baytown ceramic tradition is "distinguished in being particularly undistinguished" (Brain 1971:59). Mounds tend to be much smaller and the elaborate Marksville burial customs are replaced with more standardized, uninspired practices.

How do we explain this cultural transformation? Traditionally, archaeologists have accounted for the situation with a single or primary cause. Griffin (1960, 1967) argued that the changes in the archaeological record corresponded in time with a more general climatic shift to cooler temperatures in North America. The decline of the Hopewell in the northern Mississippi Valley then took place because maize productivity, on which the culture was based, sharply declined (Struever and Vickery 1973).

Griffin's interpretation came under strong attack from two quarters. First, as noted in the previous section, there is no evidence of intense maize agriculture during the Marksville-Hopewell period. Second, the climatic data are more equivocal than first thought by Griffin. King and Roper (1976) actually argue for a climatic amelioration during this time. They feel that this shift led to an increased use of bottomland as opposed to upland resources, and ultimately to the change in settlement patterns noted between Middle and Late Woodland cultures.

Climatic change or the lack of it is certainly an important factor to consider when assessing the Marksville to Baytown transitions. However, as a single cause, climate is not very convincing. In a similar fashion other single cause explanations fail to account for the entire process. Most of these can be refuted fairly easily such as migration (e.g. Ford 1968; Newman and Fowler 1952), violence or plague (cf. Pruter 1964). But one such monocausal explanation, population growth, has recently gained some support and needs to be discussed in more detail.

The problem of the Middle to Late Woodland transition in the Central Mississippi Valley region is accentuated by a general paucity of sites and material remains that are attributable to the Marksville period. In contrast to Marksville, Baytown sites and artifacts are abundant. Elsewhere, to the south and in the Lower Valley region, Middle Woodland Marksville remains are numerous and the transition from this period into the Late Woodland Baytown period is clearly defined. Similarly, although local discontinuities are apparent in the archaeological record, Middle and Late Woodland cultural remains are clearly represented north of the Central Valley region.

Within the eastern lowlands very few sites have been positively identified as Middle Woodland. The Helena Mounds site, located near the junction of the Mississippi and St. Francis rivers, exhibits classic traits that are typical of both Marksville and Hopewell cultures (Ford 1963). Mound City, located near West Memphis, Arkansas also appears to contain recognizable Middle Woodland remains (Morse and Morse 1983). This site, however, has not yet been extensively investigated and little is, therefore, known about the potential antecedents of Baytown in the area.

The lack of a Middle Woodland base from which an indigenous Baytown culture could have developed, or "regressed," leads to two important hypotheses. Morse (1969) has suggested that a population hiatus might explain the absence of Middle Woodland remains in the Central Valley. The problem with this hypothesis comes with attempting to explain why such a hiatus occurred, especially when the remains of earlier cultures abound throughout the region. Although Morse (1980) has proposed that climatic changes may have effected a depopulation of the region, this explanation does not seem to be wholly satisfactory.

Another hypothesis is that Middle Woodland remains exist but have simply not been recognized. House (1975:157) has suggested this possibility as an explanation of the paucity of Middle Woodland sites in the Cache River Basin. Investigations on identifying and defining Middle Woodland in terms of classic Marksville/Hopewell traits could very well have overlooked a localized and early manifestation of ceramic assemblages that are the "masked" predecessors of Baytown. Early plain and decorated sand and grog tempered types are known to occur; however, these are generally found to be intermixed with later classic Baytown assemblages. Clear segregation of such assemblages is, therefore, difficult or impossible, and for this reason an earlier local version of Baytown, or at least a Baytown-like ceramic tradition, may have gone unnoticed. To modify Morse's (1969) original hypothesis, we may speak then of a "cultural hiatus" in which the Central Valley populations were basically not involved in the more spectacular developments and changes that were taking place to the north and south in Hopewell and Marksville.

The available data from the entire Mississippi Valley indicate a sharp increase in the number of sites during the Late Woodland period. Most investigators agree that even if Late Woodland occupations were

less permanent than those of the Middle Woodland period the increase in the number of sites occupied per year could not account for the total difference in the number of sites between the two periods (cf. Brain 1971).

Thus, while there is consensus among archaeologists that the Late Woodland period is also associated with an increase in population, there is less agreement among archaeologists on whether to view this increase as a cause of culture change or a response to that change. Some, such as Styles (1981), have argued that the presumed population growth caused environmental stress that led to a shift in adaptation incompatible with the Hopewell-Marksville social structure (Styles 1981; Whatley 1976; Whatley and Asch 1975). This argument, of course, begs the question of what led to population growth in the first place.

Recently, there has been a profuse number of anthropological studies refuting the Malthusian theory that population grows inherently until checked by the limits of the subsistence base (Glassow 1977, 1978; Cowgill et al. n.d.). In general, population size appears to be a function of a variety of social, economic, and religious factors. More often than not population growth or decline is a response to changes in one or another of these areas. While any change in population size may then trigger societal response, separating cause and effect is extremely difficult.

One problem with all the previously discussed hypotheses is that each views the Baytown cultures as the result of some sort of Marksville-Hopewell collapse. A number of investigators have approached the problem from a different perspective, however. For instance, Brain (1971) suggested that the change from Marksville to Baytown was the result of a logical and progressive development in subsistence strategies. Specifically, he contended that the cultural shift was a response to a gradual shift in emphasis from hunting and gathering, supplemented by agriculture, in the Marksville period, to agriculture, supplemented by hunting and gathering in the Baytown period.

Brain (1971) further argued that the bow and arrow was adopted on a wide scale at this time and this contention is supported by Ford (1974). This subsistence related technological innovation, coupled with an increased emphasis on food production, is hypothesized by Brain to have helped produce the patterns and traits characteristic of the Baytown period. Such a subsistence strategy would have been more conducive to dispersed settlement behavior and diffuse social structures in terms of efficiency (Brain 1971).

Similar models have also been developed by Klinger (1978) and Cleland (1976). Klinger believes that process involved a series of gradual and logical shifts from a gatherer-hunter-fisher economic strategy to an agriculture-gatherer-hunter-fisher strategy. Cleland (1976) likewise suggests that the shift from Middle to Late Woodland involved an increased dependence on agriculture. However, his argument constitutes a somewhat more extreme approach in that it suggests

that the latter employed a "focal" subsistence economy heavily dependent on maize and squash agriculture while the former Middle Woodland represents a "diffuse" economy employing an evenly balanced, less specialized strategy.

In general, however, Cleland's (1976) hypothesis is similar to those offered by Brain (1971) and Klinger (1978). Change from a diffuse economy to a focal economy is the result of a selective process in which innovations and activities that are more productive and efficient are gradually selected for, while other components of the diffuse strategy mix that are less productive are "phased out." Through time the economic base becomes gradually more limited (Cleland 1976:66).

The introduction of maize and beans from MesoAmerica, and the nutritional balance provided by squash, are hypothesized by Cleland (1976) to have stimulated a selective process that culminated in the Mississippian period intensive agricultural subsistence base. The Late Woodland period, then, serves as the transition between a diffuse economy at one extreme and a focal economy at the other.

The models advocated by Brain, Klinger, and Cleland all have merit in that they view the shift as a gradual process. These models, however, are not without problems. Styles (1981) has recently provided the most in-depth analysis of early Late Woodland subsistence available. Although her work was conducted in the lower Illinois Valley, her conclusions apply to a larger portion of the Mississippi Valley and certainly encompass the Big Creek area. Styles found no evidence for major changes in subsistence strategies between Middle and Late Woodland times. Instead, her data indicated a trend towards "settling in" characterized by an extreme emphasis on local resources.

Explaining the shift from Marksville to Baytown seems to hinge on articulating three factors; the nature of Marksville culture, shifts in subsistence, and population growth. The Marksville and Hopewell cultures were characterized by a considerable amount of socio-political centralization. This pattern of large-scale social and political cohesion appears to have been abandoned by the succeeding Baytown period. From the scant evidence available for the Central Valley, Morse and Morse (1983) have devised a somewhat different perspective of Middle Woodland settlement in that region that is more like what is considered typical of Baytown than of either classic Marksville or Hopewell. They (Morse and Morse 1983:162) note that, "in general, the site pattern is one of dispersed, small, autonomous villages." This appears to be particularly true of the later part of this period, and continuity from Middle Woodland into Baytown is, therefore, easier to visualize.

The absence of classic "Marksville" traits and the apparent collapse of this "florescence" elsewhere leads Central Valley Baytown to be looked upon as a regression or collapse in cultural complexity. This perspective may not be fully accurate. Florescences of material culture that reflect increases in social and political complexity may

function only to reinforce new or emerging systems. Once new ways of life have become entrenched within the mainstream of everyday culture, such ceremonious reinforcements may become obsolete. The transition between Middle and Late Woodland culture might be viewed from such a perspective. While obvious changes occurred between these time periods, Baytown culture may, in fact, represent a "plaining-out" or "settling-in" of new ideas that were introduced during the previous Marksville period.

The Barnes - Baytown Dichotomy

As discussed above, one of the most striking aspects of the Baytown period in the Central Valley is the presence of two spatially segregated ceramic traditions, Barnes and Baytown. Barnes ceramics are most easily distinguished by the sandy texture of their paste while purely Baytown ceramics are tempered with grog or baked clay (Phillips 1970; Williams 1954). The Barnes ceramic tradition seems to be concentrated on the braided stream terraces in the Eastern Lowlands. Baytown, however, is more wide-spread, occupying the Holocene meander landscape of the Central Mississippi River Valley (Morse and Morse 1983; Morse 1977).

Interpretations of this distribution of ceramics vary but Morse (1977, 1980) has strongly advocated an ethnic association for each tradition. Williams (1954) and Phillips (1970) use the Barnes ceramics as the basis of their definition of the Dunklin phase, although Phillips (1970:903) warns that the sandy paste that is characteristic of Barnes may actually be related to environmental factors rather than cultural ones.

The Central Valley Baytown and Hoecake phases are defined primarily by quantitative differences in represented Baytown ceramic types within these respective assemblages. Hoecake is found primarily within the bootheel region of Missouri while Baytown is generally confined to the Holocene land surfaces in northeast Arkansas. In between, and slightly to the west are those sites which contain assemblages of sandy textured ceramics that are indicative of the Barnes phase.

The differences between Baytown and Hoecake, on one hand, and Dunklin on the other, however, do not appear to be restricted exclusively to the differences in their ceramic assemblages. Mound sites appear to be associated with the Baytown and Hoecake phases, but none have been identified that contain Barnes ceramics. This may indicate a higher degree of social and political complexity on the part of Baytown and Hoecake, although all three phases have been characterized as segmentary, autonomous tribal organizations (Morse 1975, 1977). The presence of exotic materials at Baytown sites has led Morse (1980) to conclude that some form of pan-tribal exchanges may have been carried out between local mound centers. Low level organizations and social integration may have centered on "Big Men" who controlled local exchange systems (Morse and Morse 1983).

Barnes sites are generally small and are associated with small midden deposits. Baytown sites, however, appear to have been somewhat more intensively occupied than Barnes sites, which again is potentially indicative of greater social cohesion and integration. This basic settlement and socio-political pattern is in agreement with Brain's (1971) concept of Late Woodland culture in the Central Valley region, which envisions populations as being divided into small, autonomous and economically self-sufficient groups.

Differences in the subsistence base between Barnes and Baytown have, until recently, not been considered substantial. Based on data gathered from Brougham Lake (Klinger et al. 1984) however, there is evidence that Baytown groups may have been more heavily dependant on cultigens than Barnes populations. No positive association between Barnes and maize production, for example, has been demonstrated, although Baytown subsistence seems to have been at least partially dependant upon this resource.

The Rise of the Mississippian

The origin of Mississippian culture in the Central Mississippi Valley is the subject of considerable debate. This controversy hinges upon two opposing hypotheses, one which advocates an *in situ* development of Mississippian culture out of the indigenous Late Woodland populations, and one which argues that these local populations were Mississippianized through contact with a fully developed, migrating, Mississippian chiefdom.

The basis of this latter hypothesis, which is proposed by Morse (1975, 1977, 1980) is a model formulated by Sahlins (1961, 1968). In applying this model to the Late Woodland/Mississippian transition, Morse suggested that the loosely structured Dunklin society was absorbed by a Mississippian chiefdom which migrated into the Central Valley from the north around 800 A.D. The somewhat more cohesive Baytown phase culture, however, reacted by becoming more consolidated. The ensuing contact and exchange between these two groups resulted in the development of a new culture. Morse (1977) labeled this the Big Lake phase after investigations in Mississippi County, Arkansas, near Big Lake provided evidence in support of this hypothesis (Morse 1980). This early Mississippian, or Coles Creek equivalent in northeast Arkansas is characterized by Morse as having been a chiefdom organization that retained some elements of Baytown culture but which was also pursuing the path toward the more elaborate and complex Mississippian societies to come.

Morse's basic problem with an *in situ* development is that he, and others find it difficult to envision the evolution of Mississippian culture out of an apparently mundane Baytown base without the assistance of outside stimulus from the Mississippian core area in southern Illinois. The absence of a suitable subsistence base, and the apparent autonomy of Baytown society are primary reasons for this perspective. At the Zebree site (3MS20) evidence appears to support Morse's hypothesis of a migratory Mississippian chiefdom.

Support for an in situ development comes from Brain (1971), who has, from the beginning, argued against what has become a stereotypical view of Baytown culture, that begins with its own apparent origins in the "collapse" of Marksville and Hopewell culture. For instance, Brain (1971) hypothesized that maize agriculture first became important in the subsistence base of Late Woodland groups. He also suggested that the dispersed pattern which appears to characterize Early Mississippian settlement (Morse and Morse 1983) in the Central Valley is a continuation of the pattern of dispersion that was diagnostic of the preceding period.

Brain (1971) sees the development of Mississippian out of local Baytown as a logical evolutionary transition. Ideological influences from the north introduced new material elements into the evolving Baytown cultures, and innovations, such as shell tempering, were certainly transmitted from core areas. The basic patterns of subsistence, settlement, and sociopolitical organization that more clearly define Mississippian culture, however, were according to Brain, local developments that followed a logical progression out of Baytown.

As Schiffer and House (1975:170-171) note:

> This model of segmentary organization seems especially appropriate to the nature and distribution of late Woodland components throughout much of the Lower Valley. However, it was probably on this social base that chiefdom level social organization developed at the end of the Woodland stage.

One aspect of this controversy that seems to complicate the situation concerns our current concepts of Late Woodland and Mississippian culture. Each of these archaeological constructs was originally defined by narrow lists of traits that were mostly derived from seriations of ceramic assemblages. While establishing chronologies is certainly an essential and first order task, it has for sometime been recognized that the significance of these ceramic attributes, as functional material elements in a dynamic cultural system, has not always been adequately assessed or clearly understood. The meaning of these constructs, in terms of cultural processes, then has also not been traditionally appraised, and their utility or suitability for use in addressing questions of dealing with change, and cultural dynamics, is also in question (Hill 1977).

Recent attempts to refine the definitions of these already established archaeological constructs have focused upon the adaptive aspects of cultural systems. This approach has afforded archaeologist, to some degree, with an explanation of those material traits which were originally used to formulate these analytical divisions in the first place, and in some respect compensation, in the form of understanding, has therefore been achieved. Yet by working within the confines of these already established analytical frameworks, such as

Mississippian and Late Woodland, researchers are in effect striving to confirm with their data a preconception that in some cases may represent a misconception. This approach has, in some instances, achieved a rationale that is on par with "beating a dead dog to make it behave."

No alternative is offered here. The fact that most of these constructions are so ingrained in the literature and the normative thinking of most archaeologists, argues foremost that even to attempt an alternative would prove fruitless and would probably be met with loud protest.

A different perspective of the current approach, however, may possess the unusual quality of being both acceptable and useful, at least to some. This perspective, which has certainly been used before by others, is one which examines the attributes of a culture without trying to confine these elements within strict temporal blocks. The advantage of such a perspective is that it allows for gradual processes of change to take place, something that most present analytical units are simply incapable of providing. This is the case no matter how much we remain conscious of the limitations of these constructs in terms of diachronic studies. The bias of quantum leaps, and of continuity or discontinuity is still present in the organization of data, and in our results. The fact that archaeologists are even concerned with so-called "transitional" periods clearly demonstrates the inadequacy of period constructs in dealing with culture change.

B. Smith (1978), as noted earlier, has refined the definition of Mississippian culture so that it now represents a distinct pattern of adaptation to the lowland, meander belt, lake environment. If the many other criteria which are used to define Mississippian, such as shell tempered ceramics, platform mounds, chiefdom organizations, etc. are ignored for a moment, mounting evidence from the Central Valley suggests that the origins of Smith's Mississippian adaptive pattern may actually be founded in the indigenous Late Woodland Baytown cultures. The introduction of clearly "Mississippian" traits, though either amalgamation, enculturation, or diffusion would have been a contributory, but less important step in the indigenous development of Mississippian society out of Late Woodland cultures.

What neither Brain nor Morse discuss, and which seems central to understanding the process, is why Mississippian chiefdoms should be interested in the Central Valley in the first place. Morse argues that the destabilizing elements within the chiefdom form of social organization insures that such a society will continuously be budding off into new territories. The "inherent" tenure is drastically overstated and runs counter to well-studied anthropological examples (Radcliff et al. 1951). While it is possible that a chiefdom moved into the Central Valley, the exact reasons for this movement are not explained by the social form itself.

There is no easy or obvious answer to the question posed above. No coveted natural resources, other than, perhaps, more arable land, occur in the area that could not be found to the north. It is possible that access through the Central Valley was important. Mississippian chiefs to the north then may have found it to their advantage to stabilize the situation by elevating local headmen. Mechanisms allowing for this process could range from establishing ritual trading partners between local headmen and the Mississippian chief(s) to developing real or fictive kinships. Local Baytown headmen would have been hard pressed to pass up such an offer, for it would have institutionalized their authority in a way they simply could not have done on their own. Processes similar to the one outlined above have been described ethnographically for highland Burma (Leach 1954) and the North American Northwest coast (Stewart 1955). A similar archaeological model has been proposed by Flannery (1976) to explain the rise of Oaxacan chiefdoms in response to Olmec influence.

While we feel the model presented above has at least as much merit as the one proposed by Morse, both models remain untested. Specific archaeological correlates would have to be defined for each model and then assessed against the available data.

Baytown and the Little Cypress Bayou Site (3CT50)

The Little Cypress Bayou site is but one example of a dispersed Baytown and Early Mississippian village or hamlet. As such its utility to answer many of the questions posed in the preceding sections is limited. To maximize the site's research potential we structured our work at two levels.

First, we focused on the site itself. Specifically, we wanted to know why Baytown and Mississippian peoples chose to live at this location. To this end a series of geomorphic and palynological analyses were undertaken to reconstruct the climatic and environmental conditions prevailing at the time of occupation. The next step was to examine the activities practiced at the site. From the field results, it was clear that the faunal preservation was far superior than any reported previously for this area. Similar results were expected for floral and pollen remains. Therefore, a concentrated effort was made to study aspects of subsistence and seasonality.

Finally, we hoped to delineate certain aspects of Baytown and/or Early Mississippian organizations. This research avenue was, without a doubt, the most problematic. Our work was confined to a restricted ROW defined on the basis of construction plans, not archaeological needs. From the outset it was clear that the heaviest surface density of artifacts was northwest of the stripped areas (see Chapter Four). Presumably this area was also the most intensively occupied. Thus, our ability to examine the Baytown social community is virtually nonexistent.

While we may not be able to discuss social relations at the community level we can examine some of these relations at the household

level. Potential structures were discerned at 3CT50 and a concerted effort was made to analyze each of these separately as well as to examine variations between them.

The second level of analysis concentrated on placing the site in a regional context. Subsistence data from 3CT50 was combined with those from other Baytown sites in the Big Creek area. Subsistence focuses were correlated with settlement situations and a settlement pattern model for the Baytown period was developed. Regional social patterns and associated household artifacts from Brougham Lake were compared with 3CT50 and both were contrasted with material from the Banks site. Further differences between the Baytown regional center at Banks and the dispersed occupation at the Little Cypress Bayou site were investigated through an examination of the skeletal remains at both sites. From the results of these analyses we hoped to define a localized Baytown social and economic system similar to those described by Brain (1971) and Phillips (1970) for the rest of the Lower Valley. The "Little Cypress Bayou" system then will be compared to other local Baytown societies, and to the Barnes related group centered at Zebree to the north.

CHAPTER FOUR

ARCHAEOLOGICAL INVESTIGATIONS: METHODS, RESULTS AND SUMMARY OF FINDINGS

Introduction

The examination of research issues, as outlined in the previous chapter, was based on data derived from three phases of investigation at 3CT50. Each phase required the completion of a series of tasks, the sequence and objectives of which were specifically stated in the scope. The three-phase structure proved a convenient means of ordering the project; with only one major task suggested by NWR's proposal and added to the scheme of operations, the scope provided a technical work plan for proceeding from one phase of investigation to the next, beginning with intensive testing as summarized below.

Phase I Fieldwork

Objectives

1. delineation of horizontal site extent
2. assessment of the density and distribution of cultural remains
3. determination of site stratigraphy
4. isolation and identification of subsurface cultural deposits

Tasks

1. establishing horizontal and vertical control
2. controlled surface examination and collection

3. auger testing
4. excavation of 25 sq m and stratigraphic trenching
5. exposure and marking of all subsurface deposits
6. protection of exposed deposits

Results of each Phase I task were assessed in the field and evaluation continued into an interim analysis period, during which time NWR maintained an on-site guard to protect against vandalism, looting or other potential disturbances to exposed areas of the site. In consultation with the Corps, it was determined that Phase I investigations had produced data sufficient to warrant initiation of the next phase of excavation. However, while Phase II was predicated on results of the intensive testing phase and constituted full-scale data recovery operations, our areal focus in the second phase of field work was confined to the construction ROW. The objectives and tasks subsumed under Phase II are outlined as follows.

Phase II Fieldwork

Objectives

1. delineation of temporal and/or functional intra-site variation
2. delineation of structural patterns and cultural features
3. geomorphological reconstruction
4. recovery of data for specialized analyses to augment interpretation of archaeological remains

Tasks

1. excavation and recording of subsurface features
2. sampling midden deposits

Phase III involved the analysis of material remains recovered during Phases I and II, and all data syntheses necessary for completion of the project report. The scope, presented as Appendix XI in Volume II, lists the variety of tasks subsumed under this final phase of work.

Order of Presentation

This chapter is divided into four major sections: 1) a review of previous work; 2) an examination of methods and results of Phase I; 3) a synopsis of Phase II feature and midden excavation; and 4) a description of the nature and range of deposits uncovered by NWR's work. The fourth section is a summary of findings in which data from all aspects of the work are synthesized. In synthesizing these data as such, we have departed from an often typical format of individual chapters on methods, orientation and results, reported *in toto* as written by in-house staff and outside consultants within the main body of the manuscript; and we do so for the purpose of enhancing comprehension.

The mitigation program at 3CT50 produced a substantial volume of information; however, the data combine to present what seems to be a rather uncomplicated picture of prehistoric occupation and site use. Although a number of questions remain unanswered by the excavations, the interpretations and, sometimes alternate suggestions we will be making, seem suitably justified by the data; it is this combination of data from the various analyses that are important to hypothetical reconstruction, not the sheer quantity of the data itself. Consequently, we have elected to approach this and subsequent discussions as a synopsis of the work and cultural interpretations drawn from that work. For greater detail on specific components of the project, the full text of consultants' reports can be found in the various appendices of Volume II along with additional explanation of in-house laboratory methods.

SUMMARY POINTS ON PREVIOUS WORK

Salient details on earlier work at 3CT50 have been presented in Chapter One so here we offer only a summary of information available in AAS records and from previous field study by Iroquois (Iroquois 1979). We feel the major points made by previous work warrant brief reiteration because these studies provided the initial data base for the Corps' design of a phased mitigation plan.

The first visit to 3CT50 was made by a group of trained amateurs who conducted a surface collection during reconnaissance of the site area. As noted earlier, these surveyors observed the presence of a "mound," but did not elaborate further on contents, size, associated artifacts or other characteristics. The artifacts were deposited with the AAS Station Archaeologist at Jonesville, Arkansas, and were apparently diagnostic of the Mississippian and Baytown periods.

A controlled surface collection, undertaken by an Iroquois field crew in 1979 covered 2700 sq m, or approximately 12.5 percent of the estimated site area of 21,600 sq m. A 100 percent collection was made in one 2 m by 2 m sq area of each 10 m by 10 m unit, while the remainder was subjected to judgemental recovery (Iroquois 1979:73).

Iroquois' investigation produced 1618 artifacts that were used to project an average surface density of 1.2 artifacts per square meter. Figure 12 presents an artifact density map that NWR constructed using the Iroquois surface collection data; however, we were unable to relocate Iroquois' datum during our first phase of field work so some of the distributions must be viewed as approximations.

As shown by Figure 12, the distribution of artifacts recovered by Iroquois suggested that the greatest concentration of material was present on the northwest edge of the abandoned river levee. This area constitutes the highest terrain on the site and overlooks the

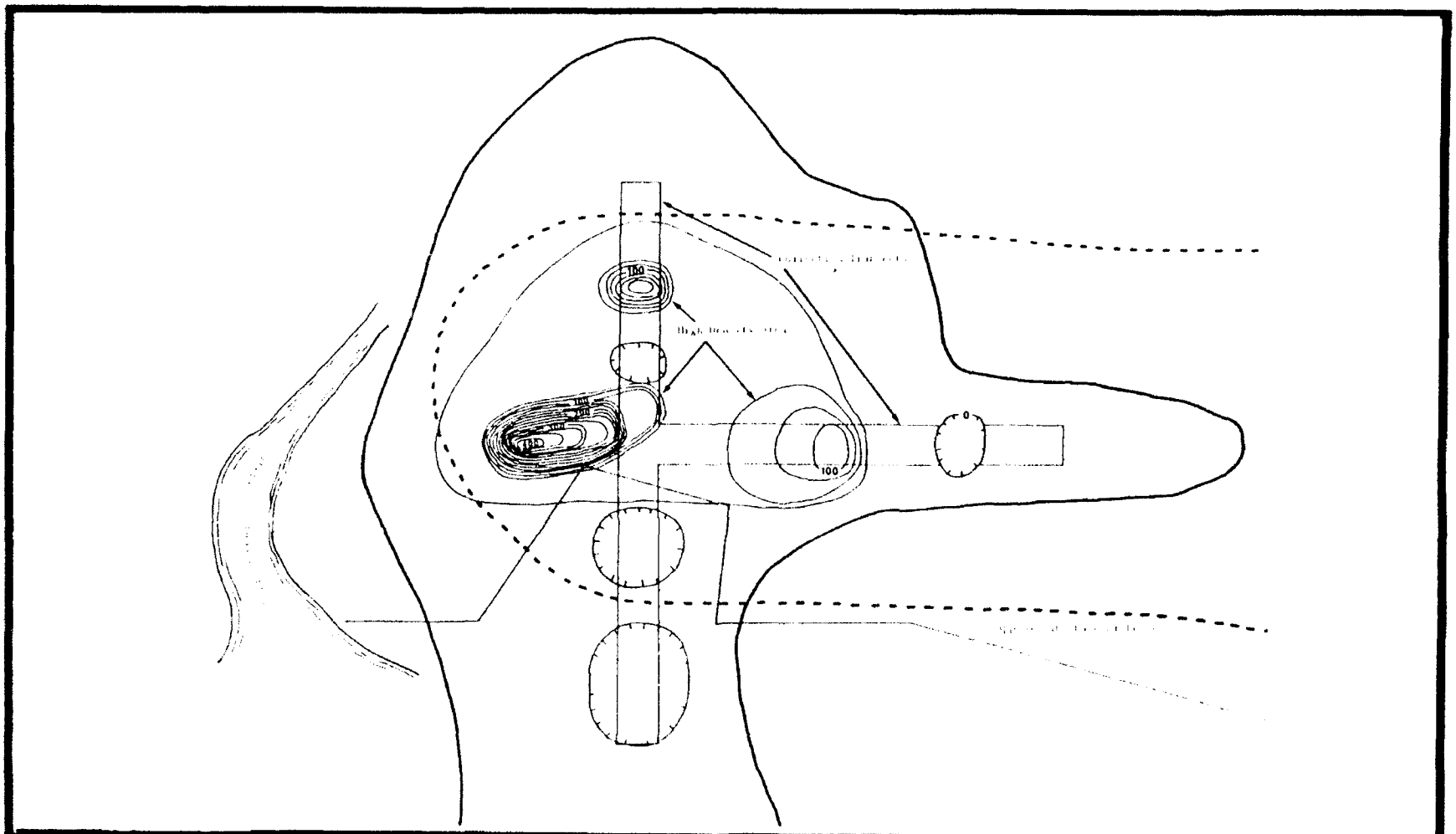

FIGURE 12. SURFACE ARTIFACT DISTRIBUTION MAP BASED ON IROQUOIS (1979) COLLECTION DATA. Note: collection unit locations are approximate.

confluence of Little Cypress Bayou with Big Creek to the southwest. Artifact density dropped substantially on the north and south sides of the levee surface; a steady decrease was also observed to the east along the crest of the levee. In addition, there appeared to be at least two other high density areas; however, these are noticeably smaller and composed of fewer artifacts than the main concentration of prehistoric materials on the western end of the levee.

In addition to the surface collection, a single one meter square test unit was excavated by Iroquois on the levee crest where the highest concentration of surface materials was recorded. Three consecutive 10 cm levels were removed. Level 1 was contained within the plowzone and produced prehistoric artifacts that included the ceramic types Baytown Plain, Mulberry Creek Cordmarked, and Neeley's Ferry Plain. In addition, a small amount of bone and one piece of lithic debitage were recovered from Level 1. Levels 2 and 3 extended into sterile yellowish brown subsoil and produced no cultural material (Iroquois 1979:73-74).

From their study, Iroquois (1979:74-75) drew the following conclusions:

> Based on the identification of diagnostic lithic and ceramic artifacts in the artifact assemblage, prehistoric utilization of the site appears to have taken place during the Middle to Late Archaic, Woodland and Early to Middle Mississippian periods. The dominance of Woodland ceramics in the assemblage suggests that the major occupation of the site took place during the Woodland period. The site is quite large in relation to others in the project area of the same time period. It may, therefore, represent a more permanent, intensive settlement.

As stated, it was on the basis of these data that tasks were outlined by the Corps for a phased approach to further site investigation that would commence with an intensive testing program. The project was structured so that investigation could proceed to Phase II, a full-scale data recovery plan, if the results of Phase I underscored a need for expanding operations.

PHASE I TESTING PROGRAM

The objectives and tasks associated with Phase I testing at 3CT50 have been summarized. NWR's approach followed that which was outlined in the scope, with a modification to use coring as an adjunct to the surface collection and prior to all stripping with heavy machinery. The importance of including a provision for some kind of systematic interval testing beyond the 25 sq m excavation cannot be understated.

Similar projects conducted in alluvial settings have demonstrated that pockets of undisturbed midden often escape destruction by the plow and, therefore, represent in situ deposits that should be treated in a manner quite distinct from that used in the search for sub-plowzone features.

Site Grid System

Horizontal and vertical control was maintained during the project by establishing a five-meter grid over the site area. As noted, efforts to locate Iroquois' datum were unsuccessful so a new marker was established for the duration of NWR's work. The site grid was extended 350 m north and 600 m east of a base line, which was tied into the permanent datum point (Figure 13). Individual grid unit squares were designated by the north and east coordinates of the southwest corner stake. Throughout the course of work at 3CT50, all mapping, collection, unit excavation and mechanical stripping were provenienced by orientation to the grid system. Field records also bear references to grid system coordinates in addition to other nomenclature such as 'Excavation Block 1' or 'Test Pit 2'.

Surface Collections and Reconnaissance

Surface Reconnaissance and Density Tabulations

Site extent was determined through a controlled surface examination that encompassed 44,500 sq m and extended beyond the area delimited by Iroquois. The surface examination consisted of a non-recovery approach in which artifacts in a square meter area were tabulated at intervals of 15 m on the east/west lines and 25 m north and south (Figure 13). The site boundary was considered to be at the point on each line when four consecutive meter square observations had failed to reveal any artifacts.

In this manner, data were recorded on more than 100 one meter squares laid out over a 120,000+ sq m area. Although the Corps' ultimate concern was an evaluation of impact within the ROW, Phase I surface examination was required over a much larger area for the purpose of defining site limits. Prehistoric remains were present in 54 of the observation squares, suggesting an extensive primary area of occupation overlooking the confluence of Little Cypress Bayou and Big Creek, and a smaller concentration in the southeasternmost grid squares (Figure 13).

Historic artifacts were also recorded as a scatter over roughly 5000 sq m, between about the E425 and E525 and N110 and N150 grid lines. The historic scatter was recent (less than 50 years) and contained debris similar to that found in the modern trash dump on the

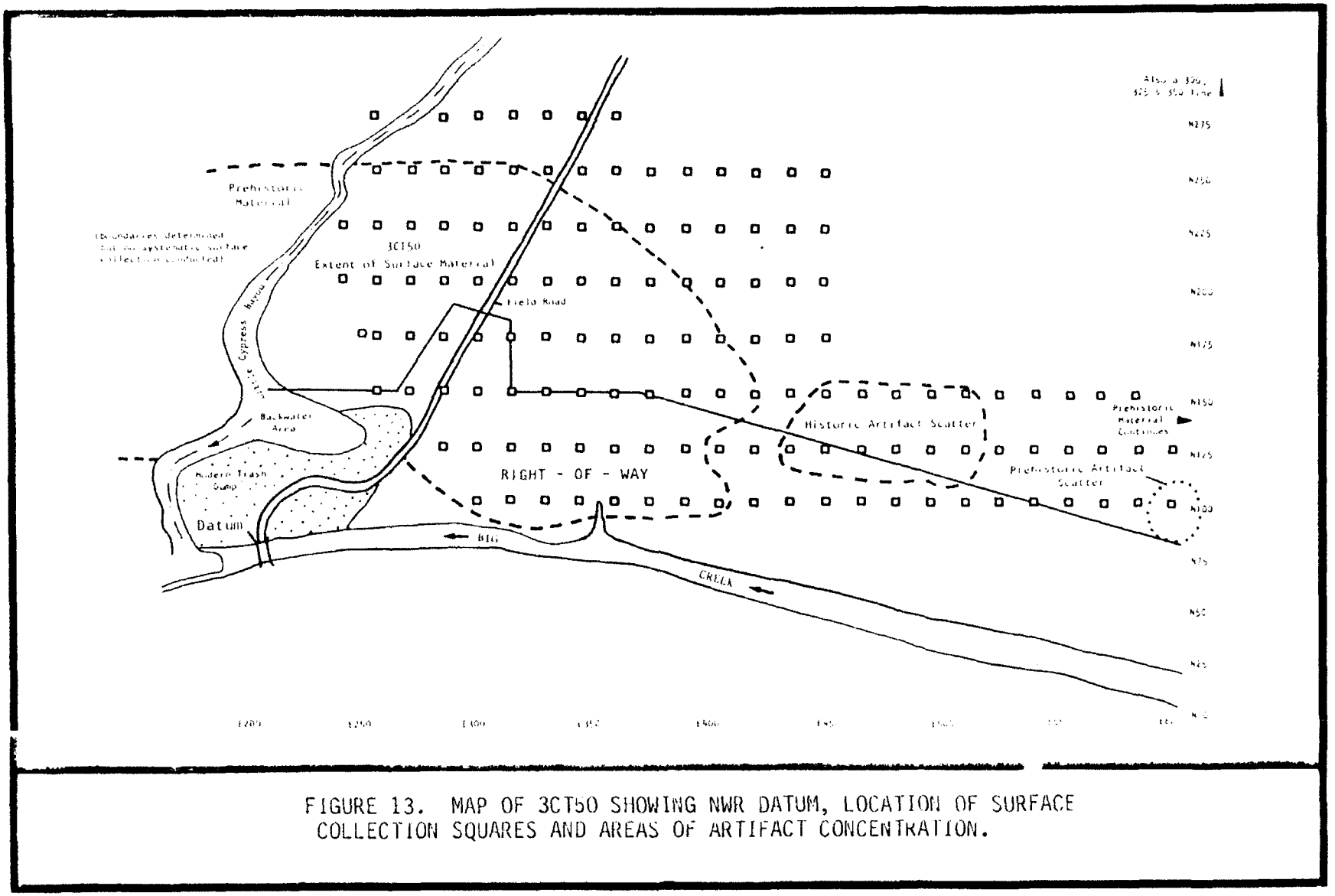

FIGURE 13. MAP OF 3CT50 SHOWING NWR DATUM, LOCATION OF SURFACE COLLECTION SQUARES AND AREAS OF ARTIFACT CONCENTRATION.

southwest corner of the project area; consequently, the materials were not dealt with beyond the task of recording their presence during the surface examination.

The prehistoric remains, however, were tabulated in the field and assigned to one of three general categories: ceramics, lithics, or miscellaneous. For each of these categories the materials were roughly sorted to divide ceramics further into three sub-categories, lithics into four sub-categories and miscellaneous as either bone or baked clay (no other types of miscellaneous items were observed). In all, the surface examination recorded 227 prehistoric remains that are broken down by categories and sub-categories and cross referenced to grid coordinates on Table 3. Preliminary analysis of the ceramic collections indicated a probable Baytown date for the principal occupation of the site; minor quantities of sherds with sand or shell temper, however, were also observed.

Artifact Density

To clarify the horizontal artifact distribution, frequencies were used to project an overall density average of 3.75 items per square meter. This figure was substantially higher than the Iroquois figure of 1.2 artifacts per square meter (Iroquois 1979:73). The higher estimate was more marked that we had expected and is likely attributable to one or a combination of three factors; differences in sampling technique, surface conditions and intra-site variation.

A measure of the third factor, intra-site variation, was obtained by using the actual frequencies recorded for each meter square to construct an artifact density contour map. Illustrated as Figure 14, the density map reveals both site extent and areas of discrete surface concentration. When the map constructed for the Iroquois data (see Figure 12) is compared to Figure 14, we see a striking uniformity. The overall distribution of items recorded by NWR's surface inspection showed the site to be only slightly larger than the size estimated by Iroquois (1979); from 21,600 sq m to 22,850 sq m. Within this occupational area, however, both studies suggested that the highest surface densities were located north of, and outside of the bridge construction and channel enlargement ROW. Artifacts tended to concentrate on the apex of the abandoned levee where it forms a knoll-like prominence that overlooks the confluence of Little Cypress Bayou and Big Creek.

Interestingly, an identical topographic situation, located immediately west of Little Cypress Bayou, is also where surface materials on that side of the Bayou are most heavily concentrated. This concentration was observed during a reconnaissance across the bayou, but no data were formally recorded on artifact type or frequencies since NWR's investigations were focused on the east bank and adjacent terrain (Figure 14).

The only major observable disparity between NWR's surface data and the results of Iroquois' (1979) work was that the small concentration of prehistoric materials east of the main occupation is not reported

TABLE 3. RESULTS OF SYSTEMATIC SURFACE COLLECTION.

Note: only units which yielded artifactual materials are listed.

	CERAMICS			LITHICS				MISCELLANEOUS		TOTAL	SURFACE VISIBILITY
OBSERVATION UNIT	Clay Tempered	Shell Tempered	Sand Tempered	Debitage	Tool	FCR	Unmodified Material	Bone	Baked Clay		(Estimate)
N100E315				1						1	55%
N100E330									1	1	70%
N100E405									5	5	80%
N100E450						1				1	60%
N100E600	1									1	75%
N125E315	1						1			2	60%
N125E330	1							1		2	60%
N125E345	1									1	70%
N125E360	1									1	70%
N125E390	1			1			1			3	60%
N125E435	1			1			1			3	60%
N125E480	1									1	70%
N125E495				1						1	70%
N150E255	5									5	50%
N150E270	16						1	1		18	70%
N150E285	2						1			3	70%
N150E300	2									2	70%
N150E315	5							1		6	70%
N150E330	4			1						5	70%
N150E345	3			2	1				1	7	70%
N150E360				1						1	70%
N150E375	7	1		2				5	1	16	70%
N150E390				1					2	3	50%
N150E405				1					1	2	70%
N150E420				1			1			2	70%
N150E450				1						1	70%
N150E465	1									1	70%
N150E480				2						2	70%
N150E510				1						1	70%
N175E250	11					1				12	50%
N175E265	4					2			1	7	50%
N175E310	9					2				11	60%
N175E325	2			3		1	1			7	65%
N175E340	2					1				3	70%
N175E370	3								1	4	80%
N175E385	1									1	70%
N200E240	8			2						10	30%
N200E255	2			1				1		4	30%
N200E270	8									8	50%
N200E285	6									6	40%
N200E300	1									1	10%
N200E315	1	2								3	90%
N200E330	1			1						2	80%
N200E345	2			1						3	50%
N200E360	1									1	50%
N225E270	5			2						7	60%
N225E285	13	2	1	2						18	70%
N225E300	14									14	80%
N225E315				1						1	75%
N225E330				1						1	80%
N225E360	1									1	85%
N225E375	1									1	60%
N250E270	1	1								2	70%
N250E285	1									1	80%
TOTALS	151	6	1	31	1	8	7	9	13	227	

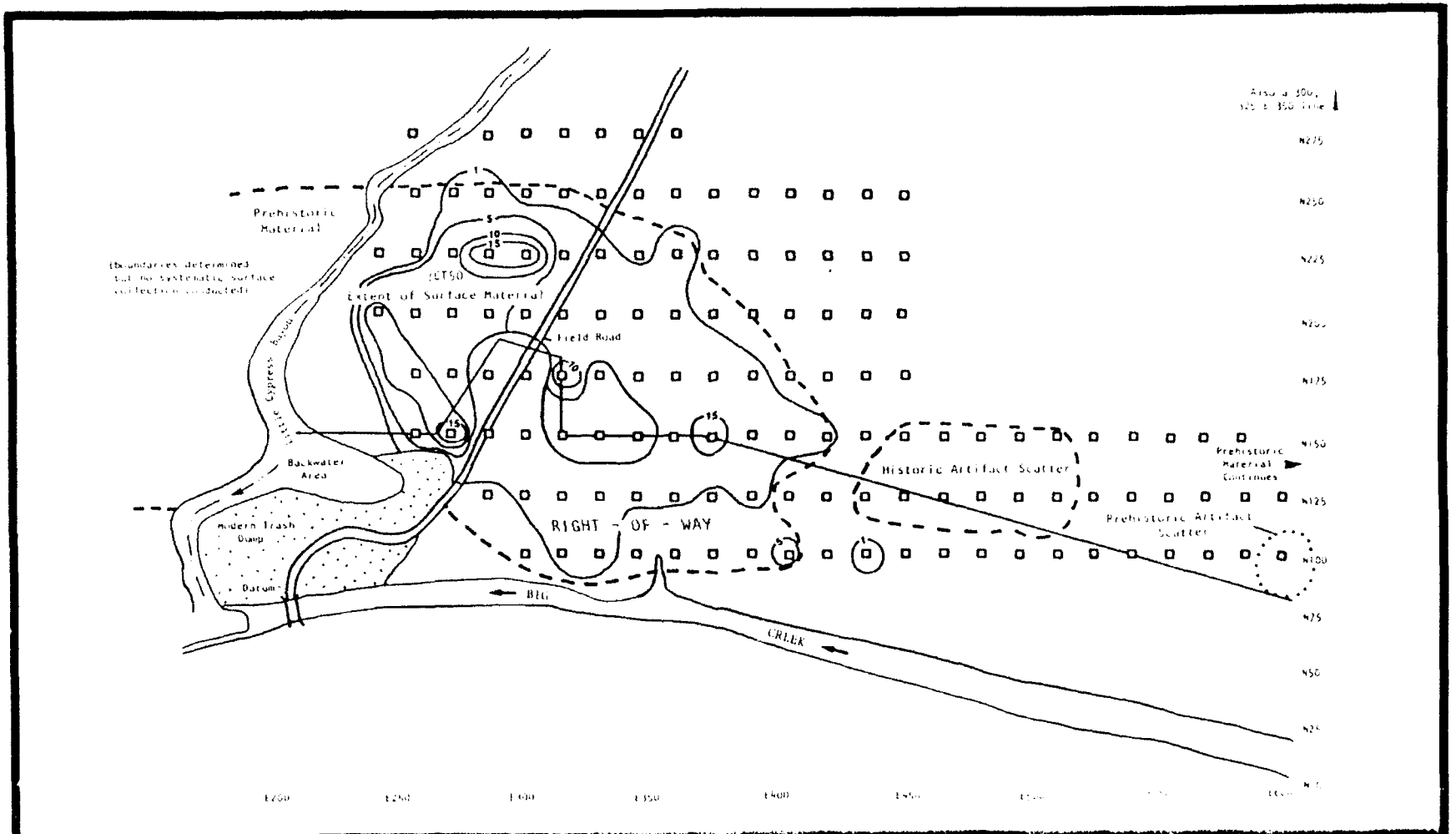

FIGURE 14. SURFACE COLLECTION MAP IS REPEATED WITH CONTOURS DRAWN TO SHOW ARTIFACT DENSITIES.

by the latter. Artifacts in this area may be a separate prehistoric site or an extension of 3CT50 not identified previously. Whichever the case, the concentration is much smaller than that observed at the Little Cypress Bayou site and artifact density appears lower. Materials are confined to the levee crest on the outside edge of the ROW; a shovel pit placed in the approximate center of the surface scatter detected no subsurface artifacts, midden deposits or features.

Mound Reconnaissance

An additional aspect of the surface examination was mandated by AAS reference to a mound-remnant west of Little Cypress Bayou. We made a general surface reconnaissance of that area, but found no trace of a mound. Artifacts were observed on top of the relict meander levee, west of where it is truncated by the Little Cypress Bayou channel. However, this artifact scatter, which extends 250 m beyond the west bank of Little Cypress Bayou is outside of the project ROW. One shovel pit was placed on a small prominence that overlooks the confluence of Big Creek with Little Cypress Bayou, but it failed to produce any subsurface materials and there was no evidence of deposits beneath the plow zone.

While this area of surface material may represent an extension of the main 3CT50 occupation west of Little Cypress Bayou, such an association could not be firmly established. Similarly, NWR's reconnaissance offered no further clarification of the reported mound. The geomorphological studies (see Chapter Two and Appendix I) indicate, however, that the formation of the cut through the relict meander levee by Little Cypress Bayou predates the prehistor occupation of the site.

Intensive Collection Within The ROW

The reconnaissance and surface examination conducted by NWR at the start of Phase I investigations demonstrated that approximately 35 to 36 percent of the site was contained in the Corps ROW. This meant that proposed bridge construction threatened that portion of the site extending up the south face of the relict meander levee to just below the apex of the rise, an area of about 8200 sq m. Having established the extent and areas of concentration, efforts were then focused on the intensive collection of materials from the site area within the ROW, and, therefore, in imminent danger of destruction from bridge construction.

A controlled surface collection was made in this area of the site prior to stripping in order to strengthen suggestions of artifact distribution and intra-site variation. The collection covered 1350 sq m in which artifacts were recovered in 74.5 sq m of the units. All artifacts observed on the surface of these squares were collected and a revised artifact density contour map (Figure 15) was constructed to illustrate patterns of distribution in the ROW. We note that surface visibility was good at the time of collection and the crew made every attempt to collect all visible materials.

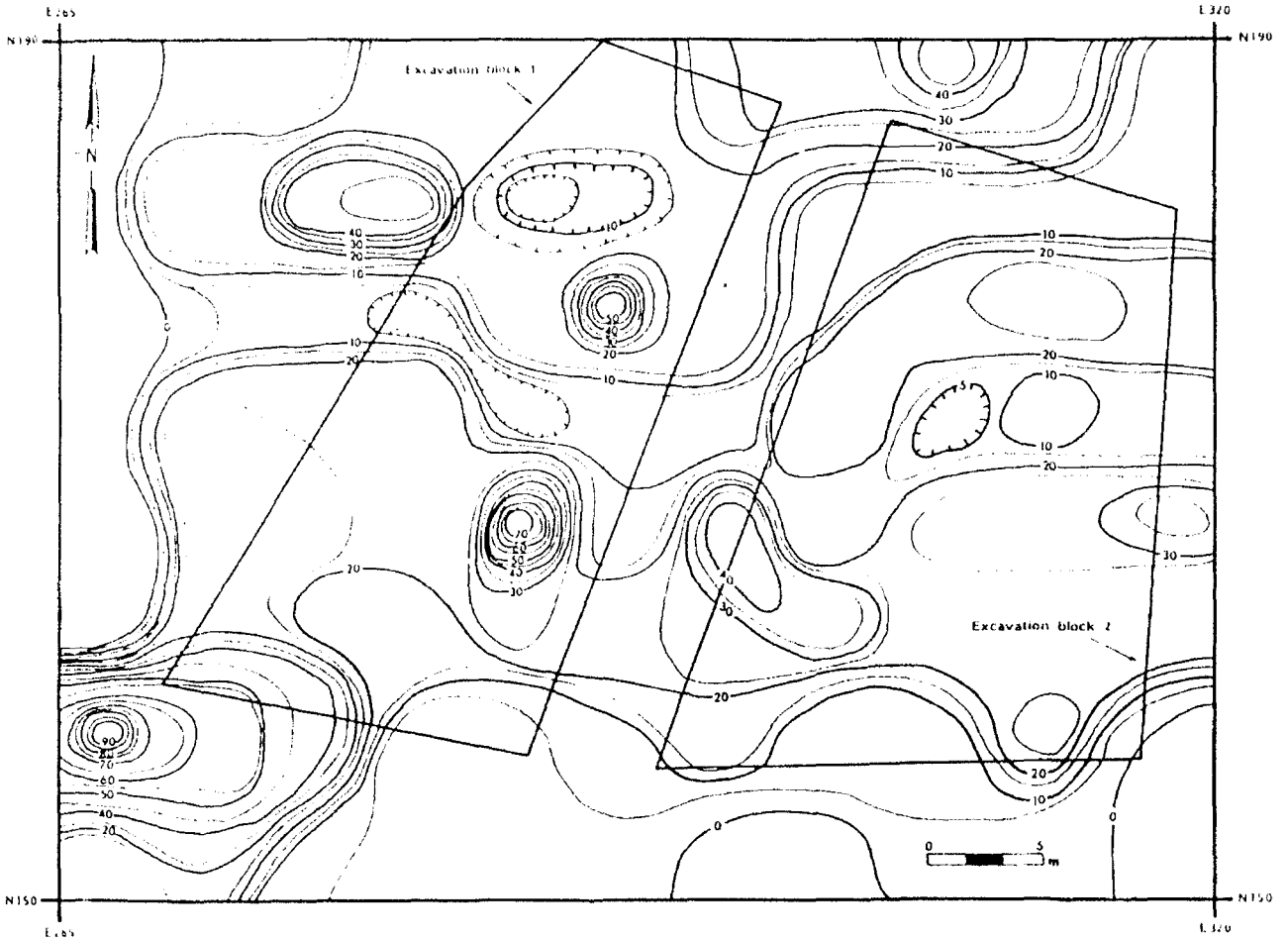

FIGURE 15. DENSITY OF SURFACE MATERIALS COLLECTED WITHIN PROPOSED BRIDGE ROW.

In carrying out this task, a total of 2119 prehistoric artifacts were recovered from light scatters as well as squares in areas of highly dense concentrations. Artifact tables in Appendix X contain a breakdown of items from the controlled surface collection along with the results of excavation. Again, however, even the preliminary field analysis of ceramics reinforced a Baytown date for the most intensive use of 3CT50.

Subsurface Testing

Coring

In conjunction with the controlled surface collection, a program of systematic interval coring was conducted with five meters along grid lines in the ROW. These cores were carried to a depth of at least one meter below ground surface. Soil color, the depth of various deposits and the presence or absence of cultural material were recorded for each test.

As noted in the introductory remarks to this chapter, the hand augering program was proposed as a safeguard against pockets of intact midden being stripped away in the search for subplowzone features. We also hoped to gain other information on site stratigraphy that would allow us to examine how closely surface patterns reflected the distribution of subsurface remains.

Implementing a program of coring proved to be a judicious expense of labor as the program defined midden areas, the extent of which would likely not have been suitably defined by test excavations alone (Figure 16). The prehistoric midden remnants were found in association with a buried A horizon at the base of the relict meander levee. Buried beneath a thick mantle of sterile alluvial clay, the midden was initially suggested by recovery of carbonized organic matter and fragments of burnt clay.

Test Excavations

This task involved the excavation of five 1 m by 1 m and ten 1 m by 2 m units (Figure 16). Placement of the units was judgemental, being based on the combined results of surface collection and coring, and designed to investigate: 1) a sample of buried A midden deposits; 2) a sample of the levee slopes at the apparent edge of midden deposits; and 3) the levee crest.

The units were excavated in 10 cm arbitrary levels, except where subdivisions within levels were made to compensate for natural stratigraphy and prehistoric features (see Appendix VIII for a correlation of arbitrary levels with natural strata). Line levels and transit readings were used to maintain control over excavation depth which was measured below datum.

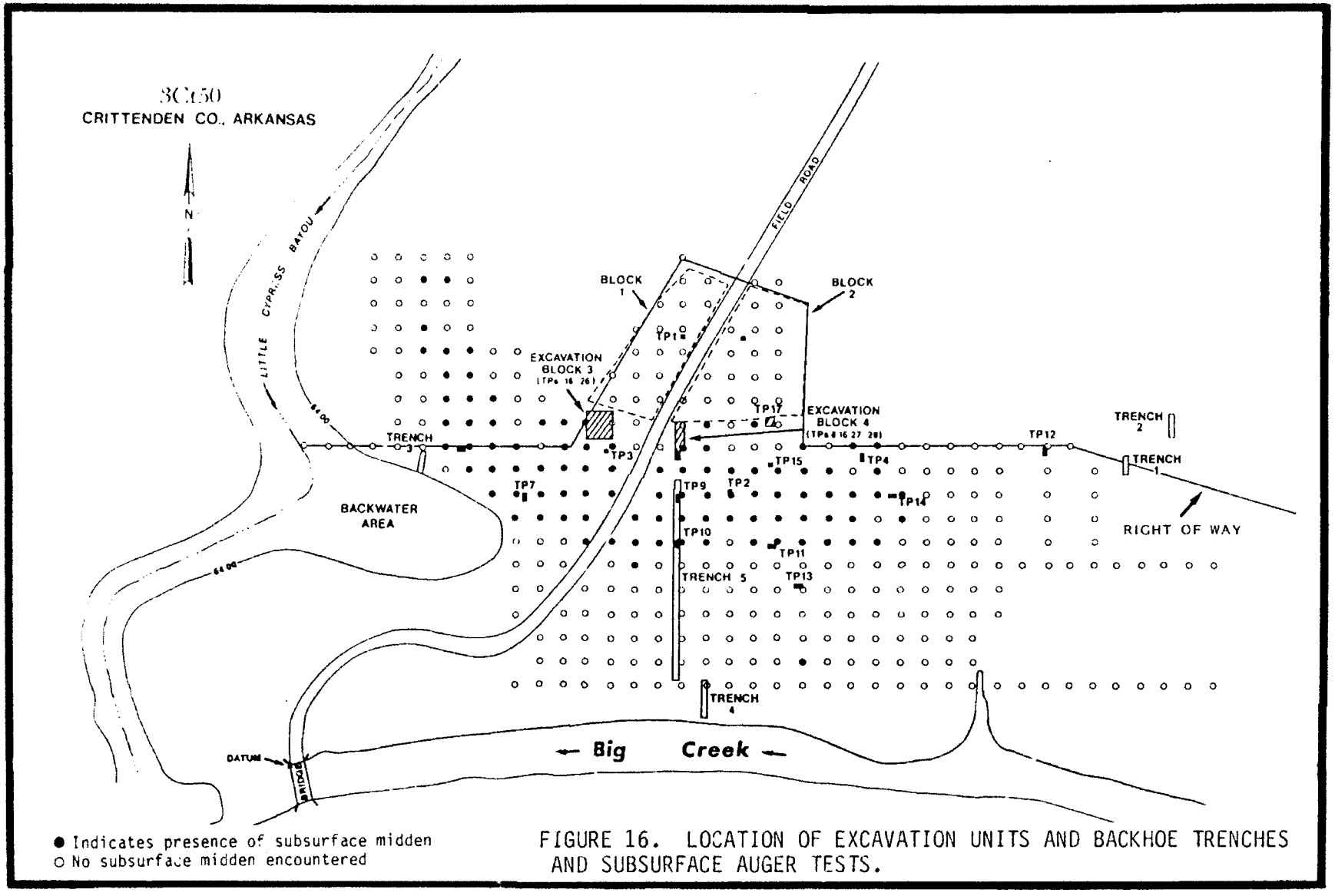

FIGURE 16. LOCATION OF EXCAVATION UNITS AND BACKHOE TRENCHES AND SUBSURFACE AUGER TESTS.

Fill was water-screened through 1/4 inch (6.35 mm) mesh wire, except for column samples that were removed for flotation. A photographic record and detailed notes, as well as standardized forms, were maintained on every aspect of excavation. Other documentation included plan drawings and profile illustrations, both of which were accompanied by concise descriptions of soil characteristics.

Trenching

Stratigraphic interpretation of the site was augmented during Phase I by the excavation of four short backhoe trenches (shown on Figure 15 as Trenches 1-4) dug in the site peripheries under the geomorphologist's supervision. Lenzer's report is presented in Appendix I, but salient points of his geomorphic reconstructions are discussed in the summary of findings sections at the end of this chapter.

Heavy Machinery Stripping Operations

The final task accomplished in Phase I was mechanical stripping on the crest and slope of the abandoned meander channel levee where subsurface testing had at once confirmed an absence of intact midden and a strong potential for sub-plowzone features. A mechanical 880 tract backhoe with a five foot bucket was employed to remove the plowzone.

The stripping operations were carefully monitored by supervisory field personnel and, with minimal disturbance, opened up a 298 sq m area that was divided between two tracts (designated Excavation Blocks 1 and 2) on either side of the field access road (refer back to Figure 15). After stripping, the block was skim-shoveled and trowelled to expose over 600 stains that were photographed, mapped and then covered for protection until the second phase of field work.

Phase I Summary

At the close of Phase I investigations, the following information had been gathered on the nature and contents of 3CT50:

1) the principal area of prehistoric occupation covered 22,850 sq m from the east bank of Little Cypress Bayou onto the slopes and crest of a relict levee overlooking the bayou's confluence with Big Creek;

2) the areas of highest artifact density lay outside the ROW along a topographic high on the levee crest (average projected density of 3.75 artifacts per square meter);

3) smaller concentrations in addition to scattered surface artifacts did occur south of the highest density area and within the ROW--average density based on the intensive collection of 2119 items from 1850 sq m was rounded off to 1.2 (exactly the figure Iroquois had arrived at for the overall area of occupation);

4) a buried A horizon was preserved in portions of the site and contained intact midden deposits associated with the prehistoric occupation;

5) the potential for cultural features was significant in the levee crest and slopes where midden had been destroyed by plowing but stripping revealed over 600 stains below the plowzone;

6) preliminary temper analysis of ceramics indicated a predominantly Baytown occupation with a possible veneer of Mississippian activity suggested by a low incidence of shell tempered sherds;

7) outside the ROW and separated from the main occupation area, a second, small concentration of prehistoric materials was present to the southeast along Big Creek;

8) prehistoric artifacts also occur on the west bank of Little Cypress Bayou where they tend to concentrate on a knoll almost directly west of the area of highest density at 3CT50; and

9) the mound reported in AAS records was not found, but its earlier existence could not be refuted with any confidence.

PHASE II ARCHAEOLOGICAL EXCAVATIONS

Phase II excavations began March 1, 1983, with a field crew of 15 individuals including the supervisory personnel. Work was concluded May 2, 1983. During this phase, a number of tasks were performed including: 1) excavation and recording of 645 features; 2) mapping of the site; and 3) excavation of a sample of the midden deposits. Furthermore, additional studies were made of the geomorphological history of the site, which included the excavation of another backhoe trench (Trench 5) in order to correlate cultural strata with natural ones.

Feature Excavation

A total of 645 possible prehistoric features were defined during Phase I and excavated during Phase II. Of these, 314 were determined

in the field to be natural occurrences, such as root stains, tree falls, and rodent burrows. An additional 26 stains were excavated, but after processing were classified as midden remnants rather than features; since these pockets of midden were excavated as single proveniences and given numbers in the feature ordering, their contents have been tabulated with the feature remains and summarized in Appendix IX. Likewise, artifacts recovered from initial excavation of natural disturbances have been tabulated in that same appendix.

The other 305 stains represented the remains of former structures and other cultural deposits associated with various prehistoric activities conducted at the site. Data on these proveniences are also summarized in Appendix IX.

In general, the excavation of individual features followed a standardized procedure. Documentation included to scale line drawings of plan views and profiles; black and white, and color photographs; and standardized field forms, as well as interpretative notes and comments. Postholes were not photographed unless they possessed some unusual quality or formed a segment of a larger structure pattern.

Large features were halved and one section removed in 10 cm levels. The remaining half was excavated following natural strata, if present. Small features, such as post molds were excavated as a single provenience. After excavation, most pits were re-photographed, and sometimes redrawn if their shape changed appreciably during excavation.

The fill from most features was saved to be processed through a flotation device. This was particularly true of small features, such as postholes and smaller pits. The fill of the large features, containing a substantial amount of soil, was usually subdivided and only a portion (about 25 percent) was processed through fine water screens. Other samples retained from features included pollen, soil, carbon-14 and burned rock. Archeomagnetic samples were recovered in the field and burials were removed by bioarchaeological consultants for specialized analyses.

Midden Investigations

Phase II midden investigations were aimed at expanding excavation to include a larger and more concentrated sample than was tested in the first phase of field work. The most extensive midden area was located at the base of the relict meander levee where portions of the deposit (designated lower midden deposit) were buried beneath a thick layer of post-occupational alluvium. Midden identified in Phase I as being adjacent to the levee slope had been disturbed by plowing.

Another area of sheet midden (upper midden deposit) was present in the extreme northern end of Block 1. Although the upper portions had been disturbed by plowing, intact deposits remained, and, in many cases overlaid subsurface features that had been dug into the sterile levee subsoil.

The majority (50 sq m) of sampling during Phase II was carried out in the lower midden deposits. As shown on Figure 17, these excavations included Blocks 3 and 4 and Test Pit 17. Figure 17 also illustrates a block excavation of upper midden immediately west of the field access road. Midden deposits in this part of the site were associated with structures and determined to be rather limited in extent.

Though grouped with larger units, midden investigation was excavated and provenienced by one meter squares. Technique was basically the same as described for Phase I except that arbitrary five centimeter levels were followed in Phase II (as opposed to 10 cm in Phase I).

SUMMARY OF FINDINGS

The combined results of Phases I and II produced a substantial body of data on prehistoric occupation of 3CT50. We are concerned here with a description of cultural deposits, beginning with a summary of site stratigraphy.

Site Soils and Stratigraphy

The stratigraphy presented a picture of both horizontal and vertical variation that reflected: 1) major geomorphological and geological events in the recent [Holocene] history of the Central Mississippi Valley region; 2) the local development of the Big Creek and Little Cypress Bayou drainages; and 3) the prehistoric and historic occupation, utilization and alteration of the Little Cypress Bayou site. Although relationships between the above processes and site soils are, to some extent, conjectural, an understanding of the depositional history at 3CT50 was a critical prerequisite to interpretation of the cultural remains.

The excavation program identified seven major soil deposits (Strata I through VII) at 3CT50.[1] A brief discussion of the strata is presented here and keyed to a schematic cross-section profile that appears as Figure 18; Appendix I contains a more indepth discussion of the results of geomorphic investigation at the site.

Stratum I

Stratum I is divided into two types of soil, the first of which is Stratum Ip and corresponds to the historic plow zone. Although Stratum Ip blankets the entire site, the plow zone exhibits vertical variation in thickness from 10 cm to 30 cm and also displays areal changes in texture and composition.

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[1]Appendix VIII provides a correlation of arbitrary levels with natural strata.

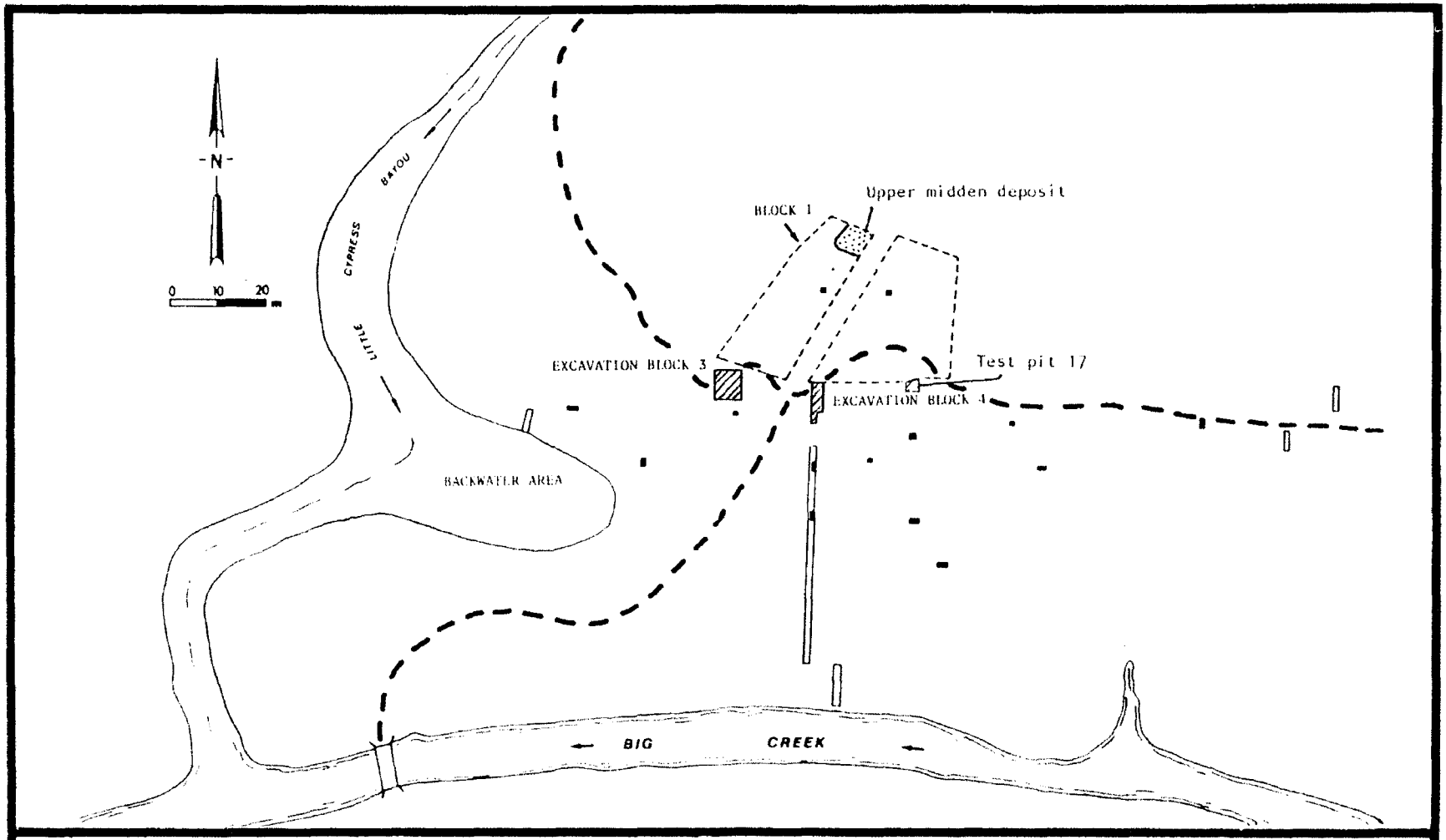


FIGURE 17. LOCATION OF THE UPPER AND LOWER MIDDEN DEPOSITS EXCAVATED AT 3CT50.

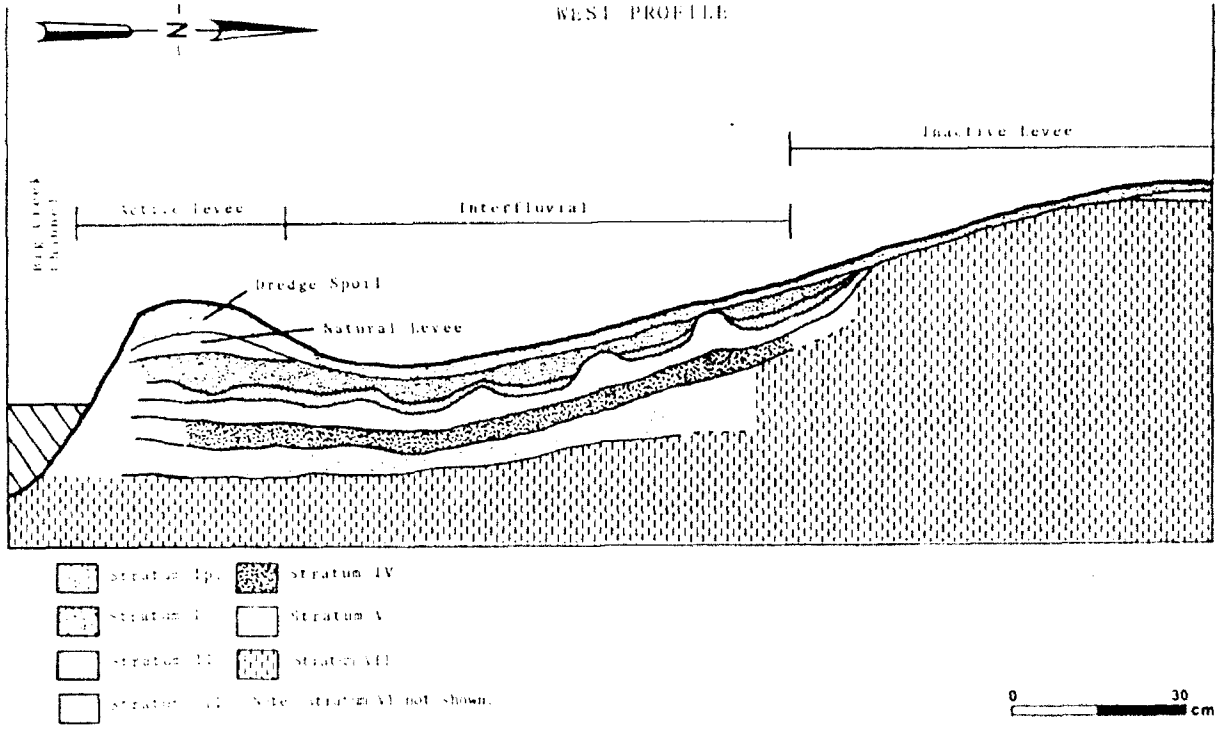


FIGURE 18. GENERALIZED STRATIGRAPHIC CROSS-SECTION OF THE LITTLE CYPRESS BAYOU SITE.

The variability in Stratum Ip is a reflection of differences in the physical morphology of underlying soils. For example, in the trough between the Big Creek and the relict Mississippi meander levee, Stratum Ip is comprised of fine textured materials that are derived from the underlying Stratum I backswamp clays. In higher areas, such as on the meander levee slopes and crest, Stratum Ip includes coarser-grained materials that may, in part, be derived from sand blow-holes, or products of seismic activity (Appendix I) that have been dispersed and mixed by plowing. Coarser materials also found within levee soils have been incorporated into Stratum Ip by plow disturbance.

Prehistoric artifacts are common in Stratum Ip where plowing has truncated, and in some cases, removed underlying cultural deposits. As a rule, we also found the distribution of plowzone materials to be an accurate reflection of surface densities. Subsurface frequencies basically replicated surface inspection and collection; artifacts were especially prevalent on the levee crest and slopes where prehistoric midden has been disturbed or completely incorporated into the plow-zone. Conversely, Stratum Ip artifacts are sparse in the trough between Big Creek and Little Cypress Bayou.

Natural soils of Stratum I are overbank deposits from the flooding of Big Creek and Little Cypress Bayou. Horizontally this stratum is confined to the east/west trough between Big Creek and the base of the relict Mississippi meander levee (refer back to Figure 18). Because floodwaters become trapped behind the natural levees, alluvial deposition occurs in a relatively stagnant environment. Finer materials tend to settle downward, and, as a result, Stratum I is characterized by poor drainage (Figure 19) and predominantly clay soils.

FIGURE 19. VIEW OF 3CT50 AFTER HEAVY RAINS WHEN WATER PERCHES ON THE SURFACE OF LOW-LYING AREAS WHERE STRATUM I OCCURS

Vertically, Stratum I exhibits considerable variation in thickness (from 10 cm to 80 cm) near the base of the relict levee this stratum is pinched out by the coarser-grained levee deposits (refer back to Figure 18).

In terms of relative ages, Stratum I post-dates the prehistoric occupation of the Little Cypress Bayou site; the few prehistoric artifacts found within this soil deposit are products of various forms of bioturbation.

Stratum II

Directly underlying and partially buried by the backwater flood deposits of Stratum I, Stratum II is a "fossil" A horizon that contains prehistoric midden material. Interpretations on the origin of Stratum II were mixed (Appendix I); however, the association of prehistoric artifacts with the A horizon in certain areas of the site is clear.

Data from stratigraphic trenching and controlled excavation revealed the current distribution of Stratum II to be irregular, a factor in its appearance that we attribute to mechanical disturbance. Again, referring to the cross-section in Figure 18, Stratum II forms a thin, gently undulating band of soil that is relatively continuous in the Big Creek active levee profile. But as the profile continues north toward the relict Mississippi River meander levee, Stratum II occurs as intermittent deposits that appear to end altogether near the levee crest (Figure 20).

Pockets of Stratum II do, in fact, occur on the upper slopes and on the relict levee crest at the northern end of Block 1. It seems reasonable to assume that the buried A horizon in Stratum II used to extend over most, if not all, of the site area. Although plowing has distorted the modern profile of Stratum II, we can certainly not equate a once more expansive A horizon with the reach of midden in its original state.

Looking at the frequencies of prehistoric artifacts, Stratum II does appear to have been a rather rich midden on the upper slopes and at the foot of the relict meander levee; the former was clearly demonstrated by midden excavation at the northern end of Block 1 and the latter occurs in Blocks 3 and 4 where Stratum II emerges from beneath the alluvial clay overburden and is exposed from plowing (refer back to Figure 18). Further south, in Backhoe Trench 5, and Test Units 2, 9, 10, 11 and 15, artifact density was very low and negligible beyond the south end of Trench 5.

Southward, the midden merges with the naturally developed fossil A horizon that extends beneath the spoil bank adjacent to the Big Creek channel. Here the boundary between Stratum II midden and naturally developed A horizon was visually indistinguishable; it was identified only by the gradual decrease in artifact quantity from the northern to southern ends of Trench 5.

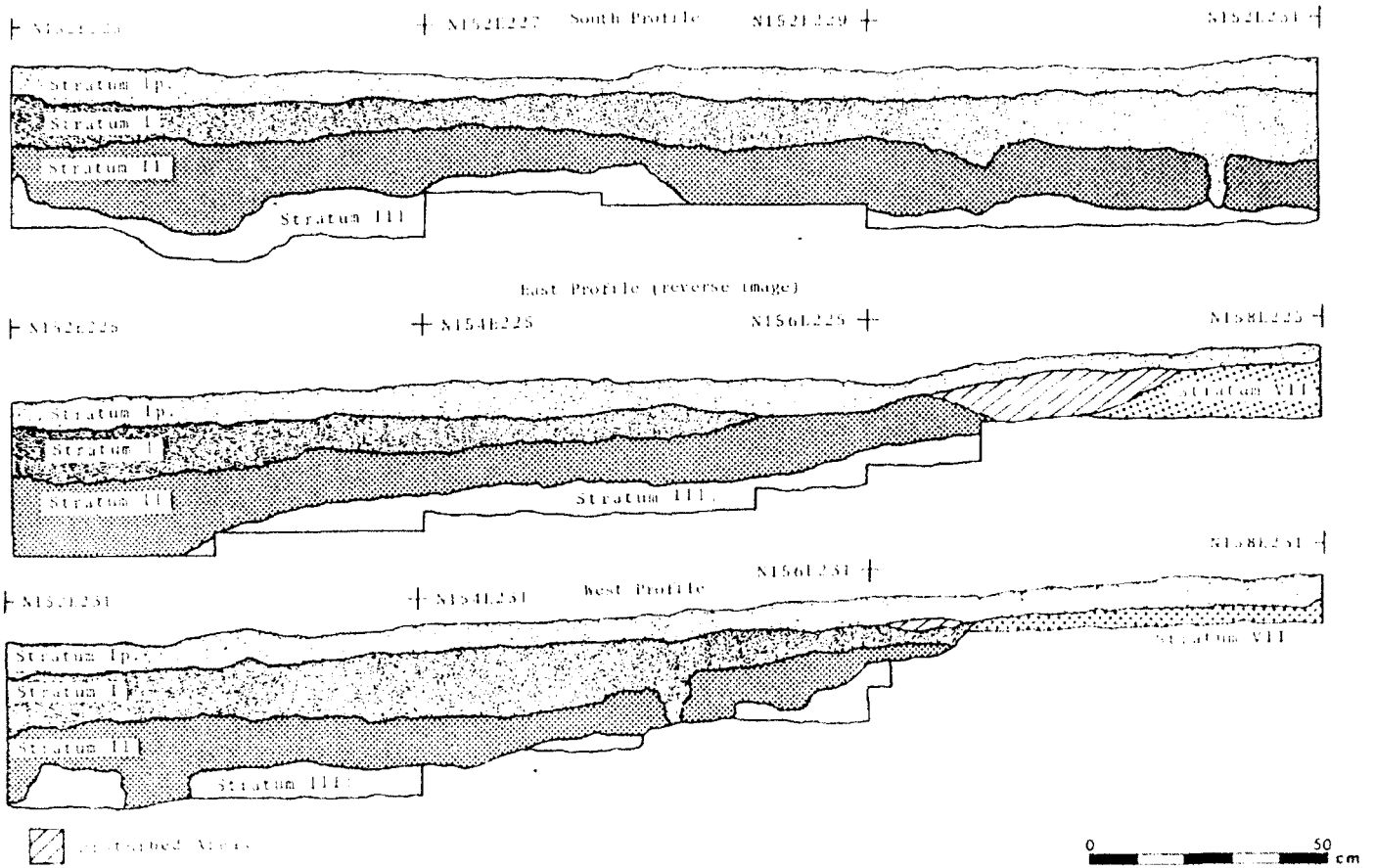


FIGURE 20. WEST STRATIGRAPHIC PROFILE OF EXCAVATION BLOCK 3.

Stratum III

Stratum III originated as backwater sediment from Big Creek overflow; the deposits of which have served to fill in an abandoned Mississippi River meander channel and oxbow lake, presently occupied by Big Creek (see Appendix I). Comprised of culturally sterile alluvial clays, Stratum III is older than Stratum I and is restricted to the trough-like area between Big Creek and the relict meander levee (see Figure 18). This deposit underlies Stratum II from which it can be distinguished by a series of undulations (see Figure 18). These channel-like features may be fossil A remnants of minor sloughs that are oriented east/west, and which also parallel the Big Creek channel located to the immediate south.

It is possible, though purely conjectural, that these features are relict channels of Little Cypress Bayou, which once fed a migratory confluence with Big Creek. The aerial photograph presented earlier as Figure 3 depicts what may be the remnants of this alternate course for the Little Cypress Bayou. This feature shows up as a dark soil extension of bayou backwater area that parallels and occupies the footslope of the relict Mississippi River meander levee. Filling in of these slough migrating channels with Stratum II material at the foot of the relict levee may have been partially facilitated through the disposal of midden material by the prehistoric occupants of 3CT50.

Stratum IV

Stratum IV is another A horizon that is buried beneath the thick alluvial clay deposits of Stratum III (see Figure 18), and is restricted horizontally to the area between Big Creek and the relict Mississippi River meander levee. This deposit may represent a period during which the alluvial filling of the relict Mississippi River oxbow lake was slowed considerably (see Appendix I); however, Stratum IV could also be a remnant of what was once a relatively stable land surface that was subsequently buried by the rapid alluvial deposition evident in Stratum III. Samples of Stratum IV, taken from Test Unit 4 and Backhoe Trench 5, failed to produce any evidence of human occupation; however, Stratum IV may extend beyond the site areas investigated by NWR, so the cultural associations cannot be ruled out completely.

Stratum V

Stratum V represents the initial phase of filling in of the post-abandonment Mississippi River meander course oxbow lake (see Appendix I); it is comprised of fine clay sediments that were deposited in a backwater or lake environment. Horizontally, Stratum V is restricted to the area between Big Creek channel and the relict levee; stratigraphically, it underlies Stratum IV (see Figure 18).

Stratum VI

In Backhoe Trench 1, Stratum V was found to grade into a coarser-grained deposit comprised of sandy silt soil (see Figure 18) that was

designated Stratum VI. This deeply buried stratum (150 cm below surface) was one of only two deposits that appear to be directly associated with the active abandoned Mississippi River meander channel (the relict levee material of Stratum VII is the second). The coarseness of Stratum VI and its location near the relict levee foot (see Figure 18) suggest it is an upper point bar, or lower levee deposit that is apparently coeval with the end of active Meander Belt 3, dated by Saucier (1974) to between 6000 and 4500 B.P. (see Appendix I).

Stratum VII

Stratum VII (refer back to Figure 18) includes all of those coarse-grained materials that make up the internal structure of the relict Mississippi River meander levee. This topographic feature is a product of stream bank land building and was formed during the 1500 year interval that the meander channel, located south of 3CT50, was active (see Appendix I). Near the levee apex, Stratum VII is comprised of clayey silts that are well drained; these grade into finer textured clays and silt clays in former backswamp areas down slope to the north and

On the relict levee slopes and crest, Stratum VII lies directly beneath the Stratum Ip plow zone, except in those areas where pockets of Stratum II midden also overlie this deposit. The upper 25 cm to 50 cm of Stratum VII may actually include thin, skin-like deposits of Big Creek overflow material. These later overbank materials, which are equivalent to Stratum III deposits to the south, are depositionally insignificant, or slight. Excavations indicated that no cultural materials are within the upper portions of the Stratum VII soil.

Soil Division Descriptions

Horizontal variation in the characteristics and depositional sequence of soils can be clearly understood by dividing the site into three areas: 1) Little Cypress Bayou/Big Creek deposits; 2) Big Creek channel fill deposits; and 3) natural levee deposits. Before concluding this section on soils at 3CT50, we offer a brief stratigraphic comparison of these divisions of the site. Figure 21 illustrates their approximate distribution and each area discussion is accompanied by profiles. Except where appropriate for explanation, descriptive data on the strata are omitted.

Little Cypress Bayou/Big Creek Deposits: Stratigraphy in this area of the site is a result o the combined alluvial processes of Big Creek and Little Cypress Bayou overbank deposits. The profile of Backhoe Trench 3 illustrates a typical cross-section (Figure 22) where the depositional sequence is plow zone (Stratum Ip), post-occupation overbank deposits (Stratum I), a midden or buried A horizon (Stratum II), pre-occupation overbank deposits (Stratum III), and oxbow lake channel fill (Stratum III or V). Stratum IV, the deeply buried A horizon, is absent (Table 4).

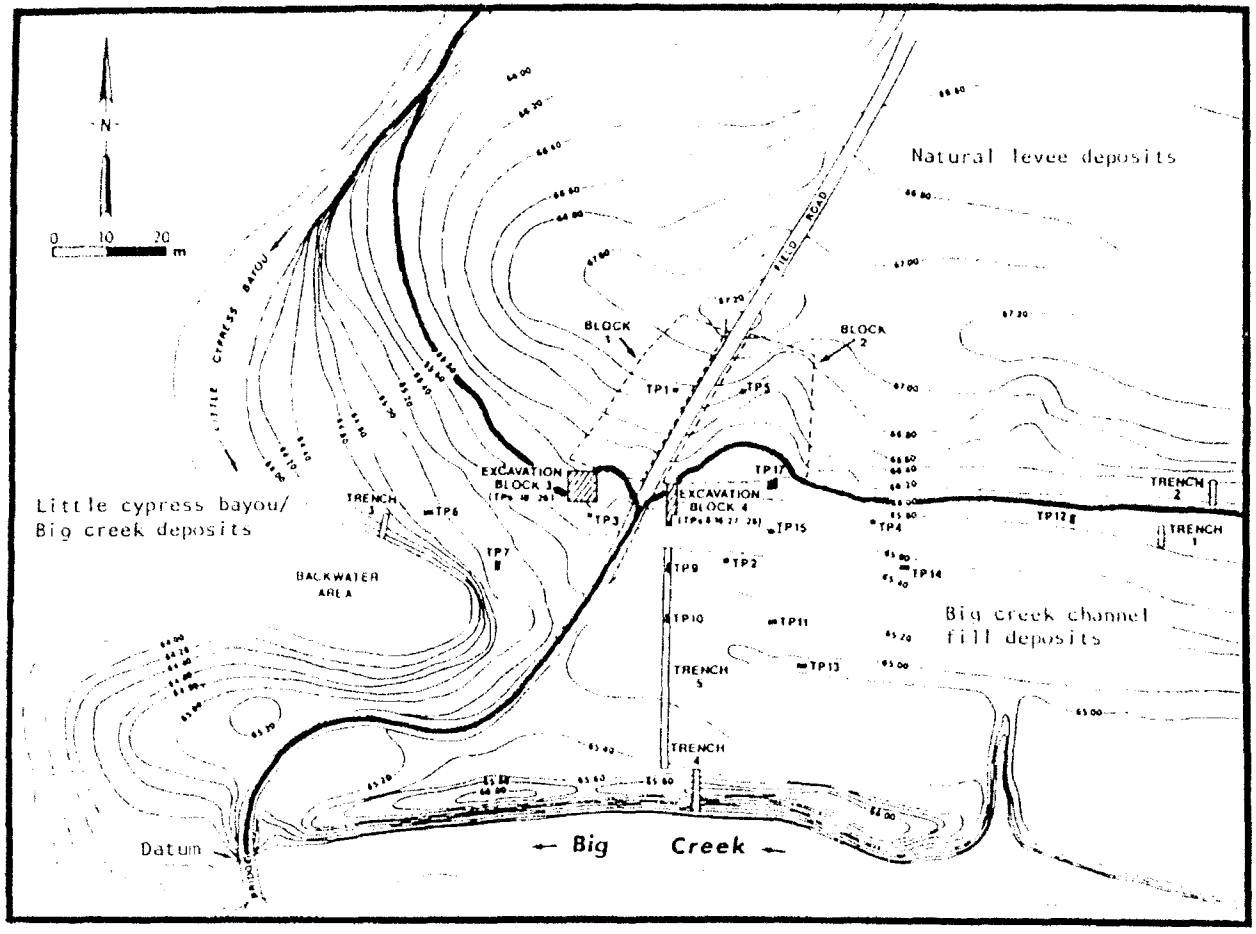


FIGURE 21. CONTOUR MAP OF THE LITTLE CYPRESS BAYOU SITE (3CT50) SHOWING LOCATION OF INVESTIGATIVE UNITS IN RELATION TO THREE DIVISIONS BASED ON MAJOR SOIL DEPOSITS.

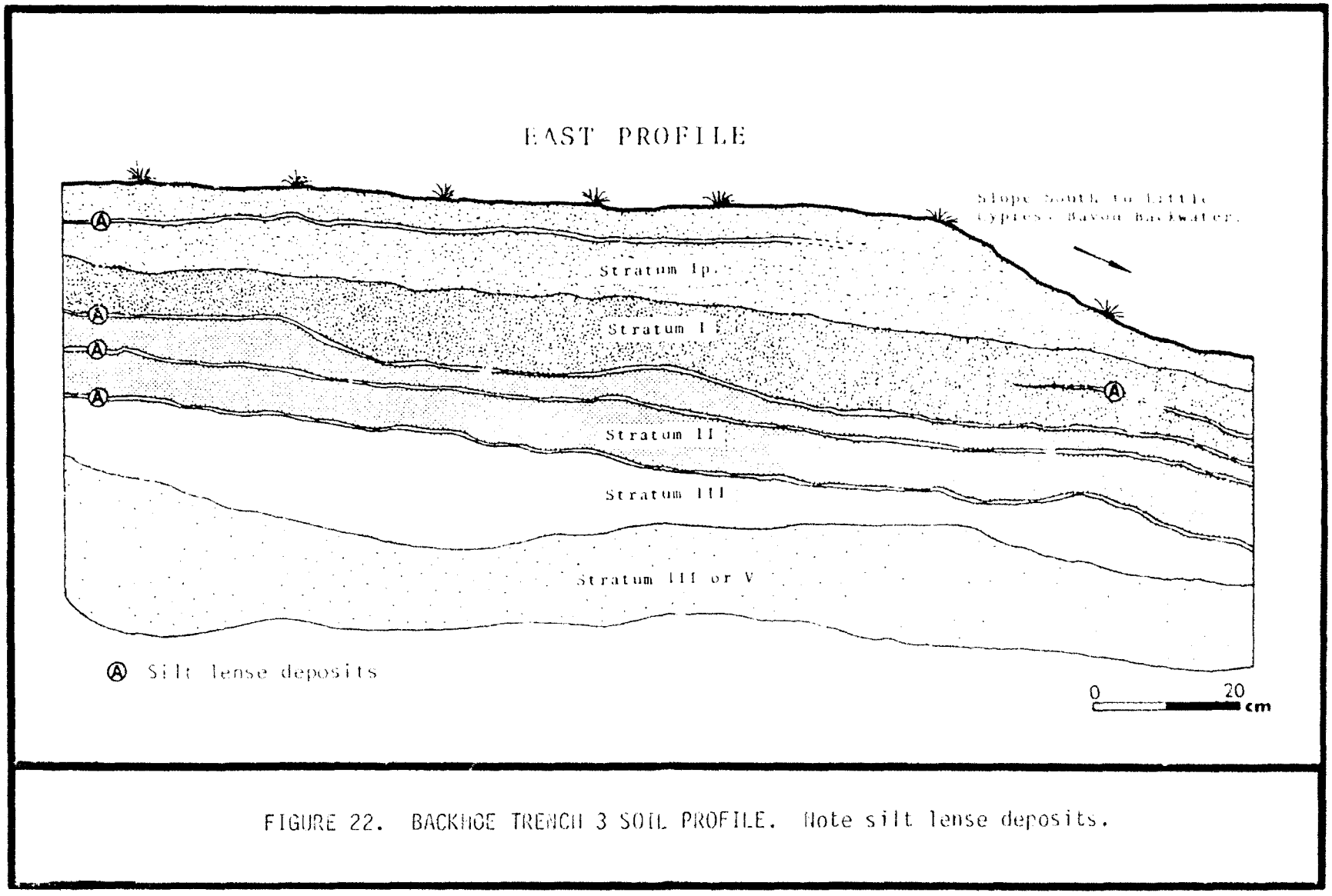


FIGURE 22. BACKHOE TRENCH 3 SOIL PROFILE. Note silt lense deposits.

TABLE 4. DESCRIPTION OF SOIL PROFILE FOR BACKHOE TRENCH 3.

Below Surface	Description
0-8 cm	Stratum Ip (Plow zone) -- 10YR3/1, very dark gray silt/clay loam.
9-10 cm	Little Cypress Bayou silt lens -- 10YR6/3, pale brown silt.
11-30 cm	Stratum Ip (Buried plow zone) -- 10YR3/1, very dark gray silt/clay loam.
31-55 cm	Stratum I (Big Creek/Little Cypress Bayou overflow) -- 10YR3/2, very dark grayish brown silt clay.
56-58 cm	Little Cypress Bayou silt lens -- 10YR6/2, light grayish brown silt.
59-64 cm	Stratum II (Fossil "A" horizon/midden) -- 10YR3/1, very dark gray silt/clay loam.
65-66 cm	Little Cypress Bayou silt lens -- 10YR6/2, light grayish brown sandy silt.
67-79 cm	Stratum II (Fossil "A" horizon/midden) -- 10YR3/1, very dark gray silt/clay loam.
80-82 cm	Little Cypress Bayou silt lens -- 10YR6/2, light grayish brown sandy silt.
83-113 cm	Stratum III (Big Creek/Little Cypress Bayou overflow) -- 10YR4/2, dark grayish brown clay.
114-138 cm	Stratum III/V? (Big Creek or Mississippi oxbow fill overbank? -- 10YR4/2, dark grayish brown with 10YR4/6, dark yellowish brown clay.

Soils in this part of 3CT50 tend to be coarser textured than in areas to the east (see Figure 21) because of an admixture of larger Little Cypress Bayou materials with the fine clays of Big Creek deposits. Silt lenses representing periodic and rapid flooding of Little Cypress Bayou also characterize this area; two such lenses 'bracket' Stratum II, which is divided by a sand lens into upper and lower midden (see Figure 22).

Big Creek Channel Fill Deposits: East of the site access road and within the trough-like area located between Big Creek and the relict meander levee are deposits best illustrated in the profile of Backhoe Trench 5 (Figure 23; Table 5). Soils in this part of the site are distinguished from those to the west by clays that result from overbank deposition by the more sluggish Big Creek stream.

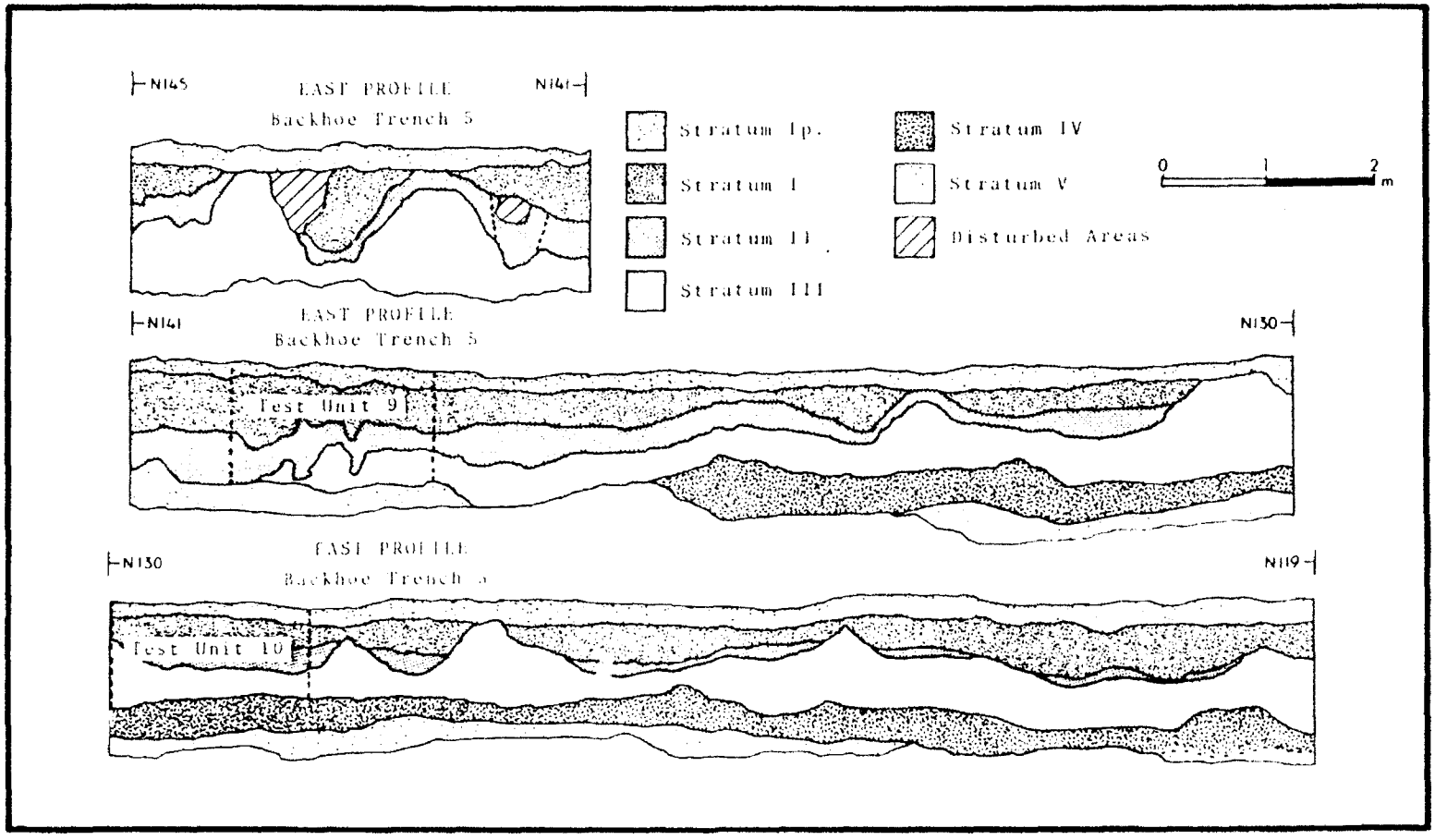


FIGURE 23. SOIL PROFILE OF BACKHOE TRENCH 5.

TABLE 5. DESCRIPTION OF SOIL STRATA IN BACKHOE TRENCH 5.
(Measurements below surface taken near south end of trench.)

Below Surface	Description
0-23 cm	Stratum Ip (plow zone) -- 10YR4/2, dark grayish brown clay loam.
23-46 cm	Stratum I (Big Creek overflow) -- 10YR4/1, dark gray clay loam, with 10YR4/6, dark yellowish brown clay loam mottling.
46-55 cm	Stratum II (Fossil "A" horizon/midden) -- 10YR3/1, very dark gray clay loam.
55-88 cm	Stratum III (Big Creek overflow) -- 10YR4/6, dark yellowish brown clay with 10YR5/3, brown clay mottling.
88-143 cm	Stratum IV (Fossil "A" horizon) -- 10YR4/1, dark gray clay loam with 10YR5/4, yellowish brown clay mottling.
143-173+ cm	Stratum V (Oxbow lake fill) -- 10YR4/2, dark grayish brown clay.

In this part of the site Stratum II is exposed in a thin strip along the base of the relict levee where cultivation and erosion have removed the overlying Stratum I deposit of clay; midden material is contained in the naturally developed A horizon, which has filled channel-like depressions that are oriented perpendicular to the present course of Big Creek to the south and the base of the relict meander levee to the north. The upper surface of Stratum III has been disrupted, possibly by the scouring or cutting effect of a migrating Little Cypress Bayou slough channel and mouth. These scoured-out, trough-like undulations in the upper boundary of Stratum III have become filled with Stratum I and II material (see Figure 23).

Natural Levee Deposits: A typical profile of this site area is illustrated in Figure 24 where the plow zone directly overlies Stratum VII levee deposits. Pockets of midden occur on the upper levee slopes, but, otherwise plowing and erosion have created a distorted profile.

Features

A total of 305 cultural features were identified and excavated at 3CT50. The cultural features were fully excavated, processed, and

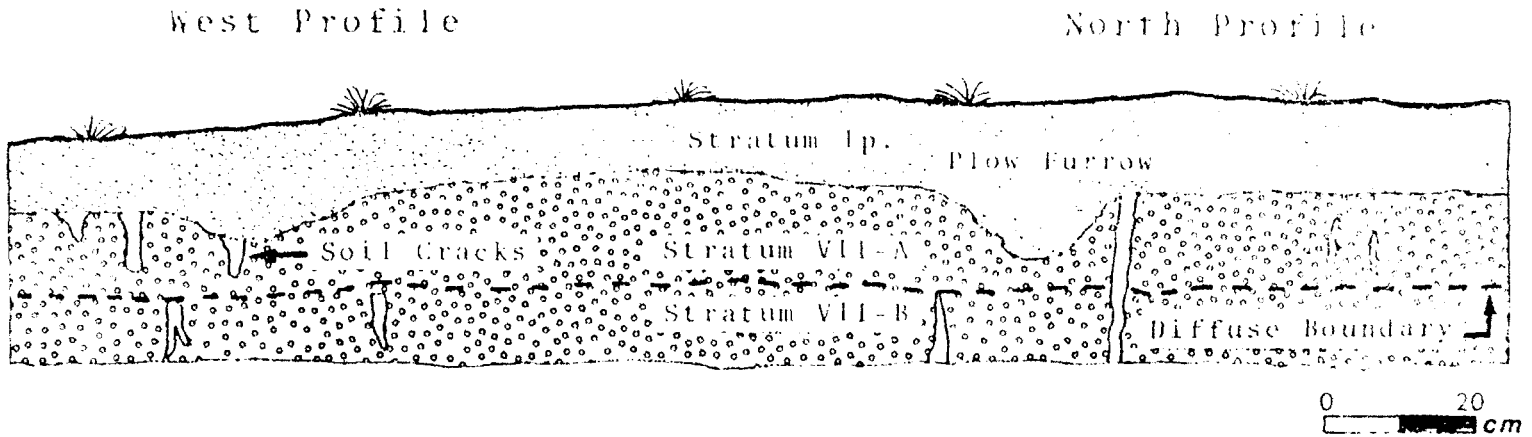


FIGURE 24. TEST UNIT 1 PROFILE SHOWING TYPICAL STRATIGRAPHIC SITUATION IN NATURAL LEVEE DEPOSITS AT SITE WHERE STRATUM Ip DIRECTLY OVERLIES STRATUM VII.

classified according to 11 categories that were constructed using clusters of morphological attributes; attributes used to define feature categories include contents, shape, size, and the presence/absence of evidence for burning. Table 6 lists general size data on the 11 categories and additional information is provided in Appendix IX, a feature summary.

All prehistoric features were restricted to the stripped areas in Blocks 1 and 2 (Figure 25); none were encountered in any of the other site areas investigated by NWR. In general, features were found to concentrate in higher frequencies in the northern ends of Blocks 1 and 2, on or near the crest of the Mississippi River meander levee. The density of subsurface features diminished substantially to the south on levee slopes and in lower midden areas.

The majority of features exhibited characteristic combinations of attributes that conformed to one of the 11 categories. Six of the feature categories are well documented in the literature; these include: Postholes (Category 1); Large, bell-shaped pits (Category 6); Burial pits (Category 8); Trenches, trough-like pits (Category 9); Amorphous pits (Category 10); and Surface hearth (Category 11).

Definition of the other five categories was more conservative. These were: Square/rectangular baked clay pits (Category 2); Round/oval baked clay pits (Category 3); Shallow, basin-shaped pits (Category 4); Straight-walled, baked clay pits (Category 5); Large basin-shaped pits (Category 7). The segregation of these five categories was a preliminary means of organizing the data for interpretation, and would probably prove useful for future investigation at sites similar to 3CT50. However, the various analyses and relative patterning suggested the potential for revision in some cases; these details are explored in the interpretations of Chapter Five.

As an organizational framework in the following discussions, original designations are retained and the basic characteristics of features within each category are summarized in text and tables that accompany most of the descriptions (exception--data are not tabulated for categories that contain only one feature). Also with regard to the feature category tables, we need to remark on the content of two columns. First, variable data are presented under the column heading, 'ceramics'. For some features, actual counts are listed, while in other instances only the chronological placement indicated by the ceramic collection (e.g., Baytown/Mississippian, Indeterminant Mississippian) is included. Where chronometric data are available, actual dates are substituted for ceramic counts or general affiliation.

Second, faunal remains are listed generally and reference any found in feature collections even if only by a single piece of bone. In the text on feature categories and, more importantly the interpretations (Chapter Five), relative proportions of faunal remains are strongly considered in assessing cultural patterns so the following series of tables should be regarded as a presence/absence list only. The same comment applies to floral remains. In both cases, the full

TABLE 6. FEATURE DATA: CUMMULATIVE CATEGORIES.

CATEGORY NUMBER	MAXIMUM DIMENSIONS	MINIMUM DIMENSIONS	AVERAGE DIMENSIONS	MAXIMUM DEPTH	MINIMUM DEPTH	AVERAGE DEPTH	SAMPLE SIZE
1	45 x 44 cm	9 x 8 cm	36.6 x 26.8 cm	70 cm	5 cm	22.7 cm	193
2	65 x 63 cm	36 x 30 cm	44.4 x 40.9 cm	30 cm	7 cm	15.8 cm	21
3	83 x 73 cm	30 x 21 cm	57.0 x 49.1 cm	51 cm	4 cm	15.4 cm	39
4	230 x 120 cm	19 x 17 cm	71.9 x 57.7 cm	34 cm	5 cm	16.8 cm	52
5	63 x 57 cm	40 x 38 cm	50.6 x 46.0 cm	43 cm	29 cm	34.0 cm	6
6	110 x 110 cm	63 x 57 cm	86.5 x 83.5 cm	70 cm	27 cm	45.0 cm	1
7	126 x 109 cm	-----	126.0 x 109.0 cm	45 cm	-----	45.0 cm	1
8	163 x 60 cm	127 x 56 cm	135.0 x 176.0 cm	22 cm	20 cm	20.6 cm	4
9	300 x 90 cm	230 x 51 cm	265.0 x 67.6 cm	30 cm	16 cm	34.3 cm	4
10	219 x 153 cm	40 x 33 cm	85.4 x 63.1 cm	13 cm	4 cm	7.1 cm	9
11	44 x 30 cm	-----	49.0 x 30.0 cm	5 cm	-----	5.0 cm	1

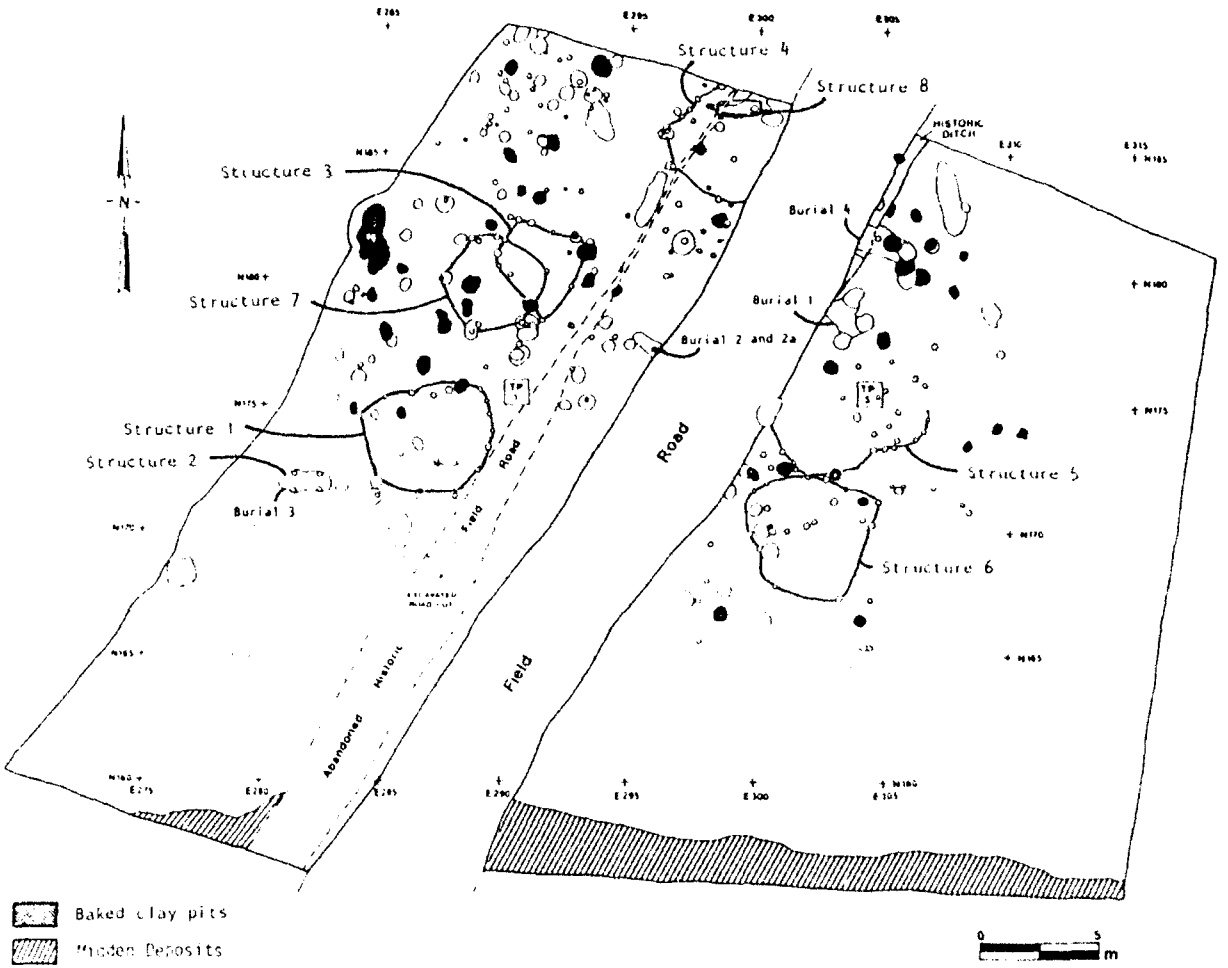


FIGURE 25. PLAN VIEW OF EXCAVATION BLOCKS 1 AND 2.

reports on specialized analyses in the Appendix should be consulted for detail on relative quantities.

Category 1: Postholes

A total of 193 features (over 70 percent) are classified as postholes (Table 7). Size ranged from 45 cm by 44 cm to 9 cm by 8 cm. Depth was highly variable, from 70 cm at the deepest to a shallow extreme of five centimeters; the average was 22.7 cm. However, depth was an imprecise measurement that had to be considered in light of the degree to which erosion and modern cultivation had altered the original occupational surface. It was impossible to accurately assess the amount or rates of surface removal, except that it has probably been more severe on the slopes of the meander levee than on its crest.

The morphology, contents and distribution of postholes were examined to see if any patterns could be discerned. Taking a conservative approach to interpretating posthole patterns, the combined data suggested that 110 may be associated with structures; of this number, 83 appear to form portions of walls, while 27 may have functioned as internal supports for ceilings, partitions, platforms and entranceways. The remaining 83 postholes are scattered throughout Excavation Blocks 1 and 2, and could not be associated with any definable patterns, but they may be external supports for roasting or smoking pits situated outside structures.

Associating individual postholes with specific occupations of the site was a difficult, and in many cases, impossible task because the volume of fill removed from the posts was small and temporally or culturally sensitive artifacts infrequent, if present at all. However, postholes that lined up as probable walls or internal supports were usually assignable to a specific occupation by their association with other features within the pattern.

Category 2: Square or Rectangular Baked Clay Pits

One of the more interesting feature types encountered at 3CT50 were 21 square to rectangular-shaped pits (Table 8) that were relatively small, averaging 44.4 cm by 40.4 cm with an average depth of about 15.8 cm. The most obvious characteristic of Category 2 features, however, was that the sides of each one invariably consisted of hard, compacted clay which was bright orange in color (Figure 26). The indication was that the walls had been subjected to intense, and, we surmise, deliberate firing. Thickness of the baked clay sides varied from approximately one centimeter to four centimeters, and, in most cases, was consolidated and relatively intact.

Many of these features shared two distinctive characteristics, the first of which is a stratified profile where the lowest stratum was a thin lens of white ash situated on top of a lightly fired clay bottom (Figure 27). Above this lens was a thicker deposit of charcoal comprised of carbonized plant remains. Small lumps of fired clay, burnt animal bone, ceramics and other artifacts were frequently found

TABLE 7. CATEGORY 1: POSTHOLES.
(Page 1 of 6)

FEATURE	DIMENSIONS	DEPTH	ASSOCIATION	DOMESTICATES	OTHER FLORAL	CERAMICS	LITHICS	FAUNAL
4	9 x 8 cm	10 cm						UNMB only
5	23 x 16 cm	18 cm						
20	12 x 11 cm	70 cm			hickory, acorn	no ceramics		
21	16 x 15 cm	10 cm				1 Baytown Plain		
22	11 x 11 cm	14 cm						
31	36 x 30 cm	11 cm		squash		crumbs only		
36	18 x 18 cm	15 cm	Structure 5*					UNMB, fish
45	19 x 19 cm	20 cm	wall post-Structure 6			1 grit temper		
60	28 x 24 cm	17 cm					flakes	1 fish scale
62	15 x 15 cm	13 cm	wall post-Structure 5					UNMB, fish
63	20 x 20 cm	30 cm	Structure 5			1 Baytown Plain		UNMB, fish
66	18 x 18 cm	28 cm	wall post-Structure 5			1 Baytown Plain		UNMB, fish
68	21 x 20 cm	22 cm	wall post-Structure 5		hickory			UNMB only
81	15 x 14 cm	38 cm	Structure 6		persimmon, maygrass	1 Baytown Plain		UNMB, fish
95	24 x 23 cm	21 cm	wall post-Structure 6		hickory			UNMB, fish
101	18 x 18 cm	24 cm	Structure 6			Baytown		
103	22 x 14 cm	13 cm	Structure 5*			crumbs only	flakes	UNMB, fish
107	21 x 18 cm	30 cm	wall post-Structure 5			1 Baytown Plain		UNMB, UNID
108	20 x 18 cm	9 cm	Structure 6					UNMB, UNID, fish
112	22 x 19 cm	46 cm	Structure 6			1 Baytown Plain	flakes	
113	23 x 20 cm	11 cm	Structure 6*		persimmon		flakes	UNMB, UNID, fish
114	20 x 20 cm	15 cm	Structure 6*			1 Baytown Plain	flakes, tool	UNMB, fish
123	24 x 22 cm	18 cm	Structure 5*				flakes	UNMB only
132	25 x 20 cm	20 cm	wall post-Structure 6					UNMB, fish
133	15 x 14 cm	19 cm	wall post-Structure 6			1 Grit temper		1 UNMB tool, fish
139	20 x 17 cm	20 cm	Structure 6*		persimmon	crumbs only	flakes	mammal, fish
141	21 x 20 cm	22 cm	wall post-Structure 5			crumbs only		UNMB, fish
142	20 x 20 cm	14 cm	wall post-Structure 5			1 Baytown Plain		UNMB, fish
144	17 x 17 cm	16 cm	wall post-Structure 6				flakes	UNMB, fish
148	12 x 11 cm	5 cm						
161	18 x 17 cm	16 cm	Structure 5*				1 tool	UNMB only
167	20 x 20 cm	13 cm	wall post-Structure 5					UNMB, fish
168	16 x 16 cm	20 cm	wall post-Structure 5		hickory	5 Baytown Plain	flakes	UNMB only

*potentially associated

TABLE 7. CATEGORY 1: POSTHOLES.
(Page 2 of 6)

FEATURE	DIMENSIONS	DEPTH	ASSOCIATION	DOMESTICATES	OTHER FLORAL	CERAMICS	LITHICS	FAUNAL
169	20 x 20 cm	19 cm	wall post-Structure 5		hickory			
178	26 x 16 cm	11 cm	wall post-Structure 5			1 Baytown Plain		
179	17 x 17 cm	14 cm						UNMB only
189A	36 x 36 cm	8 cm						
190	13 x 13 cm	16 cm						
196	18 x 18 cm	24 cm				Indet. Miss.		UNMB, UNBB, turtle
204	20 x 20 cm	20 cm			pokeweed, hickory, acorn	1 Baytown Plain		UNMB, UNBB, fish
207	20 x 19 cm	9 cm	wall post-Structure 6			1 Baytown Plain		turtle, fish
215	19 x 19 cm	11 cm	wall post-Structure 6		hickory, acorn	Baytown	flakes	UNMB, UNBB
216	24 x 21 cm	16 cm	wall post-Structure 6			crumbs only		
218B	16 x 14 cm	18 cm					flakes	
223	25 x 18 cm	16 cm	wall post-Structure 6					
227	23 x 20 cm	17 cm	wall post-Structure 6*		hickory, acorn		flakes	UNMB only
229	30 x 24 cm	35 cm	wall post-Structure 6					
230	23 x 22 cm	17 cm	wall post-Structure 6*					
255	17 x 12 cm	17 cm	wall post-Structure 6*					
262	27 x 22 cm	21 cm			hickory			
267B	21 x 17 cm	9 cm	Structure 1					
269	21 x 20 cm	20 cm	Structure 1		bean, hawthorn, persimmon, nuts, maygrass, chenopod, smartweed	Baytown	flakes	
272	15 x 13 cm	22 cm	Structure 1*		hickory			UNMB, UNBB, fish
274B	35 x 19 cm	16 cm	Structure 1					
276	31 x 24 cm	13 cm	Structure 1					UNMB only
277	29 x 24 cm	33 cm	Structure 1	squash	hickory, acorn			UNMB, fish
280	19 x 16 cm	11 cm	Structure 1		hickory, pecan, walnut	1 Baytown Plain		mammal, snake, fish
281	15 x 14 cm	10 cm	Structure 1		hickory, maygrass	Baytown		UNMB, UNBB, fish
282	32 x 28 cm	28 cm	Structure 1		composite, hickory, walnut maygrass, smartweed	Baytown		UNMB, UNBB, snake, fish
283	16 x 15 cm	7 cm	Structure 1		hickory			UNMB only
285	19 x 18 cm	22 cm	Structure 1		persimmon, maygrass			
291	25 x 22 cm	13 cm	Structure 1					UNMB, fish
303	9 x 9 cm	24 cm		bean			flakes	mammal, UNBB, fish
313	29 x 27 cm	20 cm	Structure 1*			Baytown	core, flakes	
314	12 x 7 cm	25 cm	Structure 1*		maygrass	Baytown		mammal, bird, fish

TABLE 7. CATEGORY I: POSTHOLES.
(Page 5 of 6)

FEATURE	DIMENSIONS	DEPTH	ASSOCIATION	DOMESTICATES	OTHER FLORAL	CERAMICS	LITHICS	FAUNAL
322	13 x 13 cm	9 cm				1 Baytown Plain	flakes	mammal, turtle, fish
334	24 x 21 cm	10 cm	Structure 7		hickory	Baytown	flakes	mammal, fish, turtle
342	16 x 15 cm	56 cm	Structure 3		hickory, pecan, walnut, acorn, persimmon, maygrass, chenopod	Baytown	flakes	
344	20 x 20 cm	23 cm	Structure 3			1 Baytown Plain	flakes	UNMB, fish
345	14 x 12 cm	19 cm			hickory, pecan, acorn	Baytown		UNMB, turtle
348	15 x 15 cm	16 cm	Structure 3			crumbs only		
350	15 x 14 cm	12 cm	Structure 3			1 Baytown Plain		
357	17 x 17 cm	32 cm	Structure 3		wild bean		flakes	UNMB, fish
359	22 x 20 cm	26 cm	Structure 7			Baytown		
365	20 x 19 cm	45 cm	Structure 7	squash	persimmon	Indet. Miss.		mammal, UNBB, turtle, fish
366	27 x 27 cm	30 cm	Structure 7			2 Baytown Plain	flakes	
367	30 x 27 cm	20 cm	Structure 7			Baytown		UNMB, UNBB, fish, turtle
368	22 x 22 cm	22 cm	Structure 7/3*		hickory, walnut maygrass, smartweed	1 Baytown Plain		UNMB, turtle, fish
374	15 x 15 cm	10 cm	Structure 3					
375	20 x 20 cm	20 cm	Structure 3		hickory	1 Baytown Plain	flakes	UNMB, UNBB, fish
379	13 x 12 cm	16 cm	Structure 3					
381	19 x 16 cm	24 cm	Structure 3			1 Baytown Dec.		
382	19 x 19 cm	10 cm						
404	19 x 18 cm	20 cm		maize	hickory			UNMB only
405	20 x 20 cm	18 cm				1 Baytown Plain		UNMB
406	18 x 18 cm	34 cm				1 Baytown Plain		UNMB
407	18 x 18 cm	25 cm			grape	3 Baytown Plain	flakes	UNMB, turtle
409	18 x 17 cm	28 cm			honey locust, maygrass, smartweed	Baytown	flakes	mammal, UNBB, turtle
415	13 x 13 cm	5 cm			maygrass			
418	31 x 25 cm	57 cm					flakes	
420	17 x 15 cm	19 cm			hickory, walnut, acorn	1 Baytown Plain	flakes	mammal, 1 fish scale
426	21 x 19 cm	20 cm				1 Baytown Plain		1 snail
427	15 x 13 cm	12 cm			persimmon, sunflower			
610	17 x 17 cm	33 cm	Structure 7		maygrass	Baytown/Sand		mammal, turtle, fish
612	12 x 12 cm	12 cm						bird, turtle, fish
617	15 x 15 cm	49 cm	Structure 7/3*			Baytown	flakes	mammal, bird, fish
634	45 x 45 cm	9 cm			hickory		flakes	UNMB, fish

TABLE 7. CATEGORY 1: POSTHOLES.
(Page 4 of 6)

FEATURE	DIMENSIONS	DEPTH	ASSOCIATION	DOMESTICATES	OTHER FLORAL	CERAMICS	LITHICS	FAUNAL
638	12 x 12 cm	26 cm	Structure 3				flakes	UNMB, fish
640	31 x 30 cm	52 cm	Structure 3*		hickory, walnut grape, smartweed, maygrass	Baytown & Grit	flakes	
641	22 x 21 cm	32 cm	Structure 3		hickory	2 Baytown Plain	flakes	mammal, snake, fish
642	13 x 12 cm	14 cm	wall post-Structure 5		hickory, maygrass	crumbs only	flakes	UNMB only
652	23 x 18 cm	24 cm	Structure 1		acorn	crumbs only		
655	17 x 16 cm	13 cm						UNMB, fish
660	40 x 38 cm	36 cm	Structure 7		wild bean, persimmon, maygrass	Baytown	flakes	mammal, UNMB, fish
661	15 x 12 cm	10 cm						
662	20 x 18 cm	7 cm			hickory	1 Baytown Plain		UNMB, turtle, fish
665	29 x 27 cm	20 cm	Structure 1	squash	maygrass, hickory, pecan, walnut, acorn	1 Baytown Plain	flakes	mammal, fish
666	14 x 14 cm	14 cm	Structure 1					fish only
667	14 x 11 cm	20 cm	Structure 1		hickory	2 Baytown Plain		mammal, turtle, fish
668	21 x 20 cm	26 cm	Structure 1		walnut		flakes	
669	23 x 18 cm	20 cm	Structure 7*		hickory		flakes	UNMB, fish
670	25 x 21 cm	20 cm	Structure 7					
671	20 x 17 cm	22 cm				1 Baytown Plain	flakes	UNMB, fish
672	17 x 13 cm	53 cm			hickory, acorn		flakes, tool	fish only
673	18 x 18 cm	52 cm			hickory			UNMB, fish
674	16 x 16 cm	65 cm						
675	16 x 22 cm	65 cm			hickory		flakes	UNMB, 1 fish scale
676	14 x 13 cm	17 cm	wall post-Structure 5		hickory	crumbs only	flakes	UNMB, fish
680	15 x 15 cm	20 cm		maize	hickory, maygrass	Baytown		mammal, fish
681	16 x 13 cm	18 cm				2 Baytown Plain	flakes	
683	22 x 21 cm	15 cm			hickory, walnut, acorn, maygrass	crumbs only		mammal, turtle, fish
684	17 x 14 cm	30 cm			hickory, walnut, maygrass	1 Baytown Plain		mammal, fish
686	16 x 13 cm	12 cm						
687	19 x 15 cm	14 cm				1 Baytown Plain		
688	18 x 16 cm	22 cm			hickory, walnut	2 Baytown Plain		UNMB only
693	18 x 17 cm	28 cm				1 Baytown Plain		
698	14 x 12 cm	24 cm	Structure 3		hickory, walnut, maygrass	2 Baytown Plain		UNMB, UNMB, fish
699	25 x 24 cm	7 cm				crumbs only		
703	24 x 16 cm	11 cm			hickory, walnut, acorn	crumbs only		UNMB, fish

TABLE 7. CATEGORY 1: POSTHOLES.
(Page 5 of 6)

FEATURE	DIMENSIONS	DEPTH	ASSOCIATION	DOMESTICATES	OTHER FLORAL	CERAMICS	LITHICS	FAUNAL
702	20 x 19 cm	21 cm			persimmon, hawthorn, walnut, acorn			
705B	29 x 26 cm	53 cm				crumbs only	flakes	
709	24 x 21 cm	26 cm	Structure 3					
714	24 x 21 cm	10 cm						UNMB, fish
719	33 x 33 cm	32 cm	wall post-Structure 4		wild bean, sumac, maygrass	Baytown	flakes	
725	24 x 23 cm	19 cm	Structure 3			Baytown?		mammal, turtle, fish
733	25 x 14 cm	13 cm	Structure 1*			1 Baytown Plain		
736	24 x 24 cm	13 cm	Structure 1		wild bean, maygrass	Baytown	flakes	mammal, bird, fish
739	25 x 25 cm	7 cm			hickory, walnut	Baytown		UNMB, fish
743	28 x 22 cm	12 cm			hickory	Baytown		UNMB, UNBB, fish
742	28 x 26 cm	5 cm	Structure 1					UNMB, fish
743	24 x 23 cm	16 cm	Structure 1*		hickory			UNMB, fish
744	19 x 16 cm	43 cm	Structure 1*			3 Baytown Plain		mammal, turtle, fish
745A	19 x 19 cm	26 cm	Structure 1*	maize	maygrass	Baytown	flakes, tools	
745B	18 x 17 cm	26 cm	Structure 1*	maize	maygrass	Baytown	flakes	
751	25 x 15 cm	7 cm	wall post-Structure 4		hickory			UNMB, fish
752	12 x 12 cm	16 cm	Structure 4*			2 Baytown Plain		UNMB, fish
753	27 x 24 cm	17 cm	Structure 4*			Baytown, Miss., and Grit		mammal, UNBB, turtle, fish
757	20 x 18 cm	11 cm	Structure 4*					UNMB, fish
758	26 x 24 cm	12 cm	wall post-Structure 4		maygrass	1 Baytown Plain		
762	16 x 15 cm	36 cm	wall post-Structure 4		smartweed	Baytown		mammal, fish
763	13 x 12 cm	10 cm			hickory	Baytown		mammal, turtle, fish
770	17 x 16 cm	20 cm	wall post-Structure 4					
771	26 x 15 cm	23 cm	wall post-Structure 4			Baytown	flakes	
772	10 x 9 cm	14 cm						
773	21 x 19 cm	30 cm	wall post-Structure 4			Baytown	flakes	
774	32 x 27 cm	37 cm	wall post-Structure 4	bean	maygrass	Baytown	biface, flake	mammal, UNBB, fish
775	18 x 18 cm	24 cm	wall post-Structure 4		maygrass	1 Baytown Plain	flakes	
776	38 x 36 cm	16 cm						
777	23 x 16 cm	8 cm			hickory			
778	22 x [illegible] cm	[illegible] cm	wall post-Structure 4			1 Baytown Plain	flakes	
779	24 x [illegible] cm	[illegible] cm	wall post-Structure 4			Baytown	flakes	

TABLE 7. CATEGORY I: POSTHOLES.
(Page 6 of 6)

FEATURE	DIMENSIONS	DEPTH	ASSOCIATION	DOMESTICATES	OTHER FLORAL	CERAMICS	LITHICS	FAUNAL
783	24 x 24 cm	19 cm	wall post-Structure 4					
784	25 x 22 cm	38 cm				Baytown		duck, fish
793	30 x 30 cm	26 cm	Structure 3		hickory	1 Baytown Plain		
794	26 x 25 cm	32 cm	Structure 7/3*			Baytown & Grit		
796	22 x 22 cm	25 cm	Structure 7		hickory, acorn			mouse, fish
797	21 x 20 cm	22 cm	Structure 7					
799	20 x 19 cm	21 cm			hickory, acorn	1 Baytown Plain	flakes	mammal, UNSH, fish
802	38 x 37 cm	20 cm				Baytown		
804	12 x 11 cm	43 cm				crumbs only		UNMB, UNSH, fish
808	19 x 19 cm	11 cm				crumbs only		UNMB, 1 fish scale
810	17 x 17 cm	10 cm			hickory, walnut, acorn	1 Baytown Plain		UNMB only
811	16 x 16 cm	28 cm		maize	maygrass	4 Baytown Plain	flakes	mammal, fish
812	43 x 42 cm	43 cm	(see 812A)	maize?	hickory, acorn, maygrass	crumbs only		UNMB, fish
815	30 x 25 cm	25 cm				3 Baytown Plain		UNMB, turtle, fish
816	1[illegible] x 15 cm	15 cm						
817	26 x 20 cm	20 cm				crumbs only		
818	19 x 19 cm	27 cm			hickory	Baytown		UNMB, UNSH
819	40 x 40 cm	43 cm				Baytown	flakes	
820	14 x 13 cm	15 cm						
825	17 x 12 cm	24 cm				crumbs only		
826	20 x 19 cm	23 cm				3 Baytown Plain	flakes	
828	24 x 23 cm	51 cm				Baytown	flakes	
830	23 x 19 cm	63 cm				crumbs only		
831	17 x 16 cm	5[illegible] cm				1 Baytown Plain		
833	30 x 25 cm	3[illegible] cm		maize, squash		crumbs only		mammal, turtle, fish
834	18 x 16 cm	21 cm	Structure 7					
835	16 x 15 cm	25 cm				Baytown		
837	21 x 20 cm	19 cm		maize	maygrass	1 Baytown Plain		deer only
839	13 x [illegible] cm	11 cm			hickory		flakes	UNMB only
9[illegible]	32 x 25 cm	32 cm				Baytown		
9[illegible]	25 x [illegible] cm	[illegible] cm						
[illegible]	21 x [illegible] cm	31 cm	Structure 7 A*			3 Baytown Plain	flakes	

TABLE 8. CATEGORY 2: SQUARE/RECTANGULAR BAKED CLAY PITS.

FEATURE	DIMENSIONS	DEPTH	ASSOCIATION	DOMESTICATES	OTHER FLORAL	CERAMICS	LITHICS	FAUNAL
27	50 x 35 cm	15 cm			maygrass	Baytown		UNMD, fish
28	47 x 42 cm	18 cm			hickory, walnut, acorn, maygrass, chenopod	A.D. 646		mammal, fish, bird
56	46 x 36 cm	11 cm		squash		3 Baytown Plain		mammal, fish
173	45 x 45 cm	7 cm						
174	46 x 40 cm	9 cm						UNMD only
1898	36 x 36 cm	8 cm						
3058	40 x 30 cm	14 cm						
318	58 x 49 cm	8 cm	Structure 1*		wild bean, grape, persimmon, nuts, sumpweed, maygrass	1 Baytown Plain	1 flake	UNMD, UNSD, fish
323	36 x 35 cm	10 cm	Structure 3*			Baytown	1 flake	UNMD, fish
325	56 x 51 cm	14 cm			sumpweed, maygrass	Baytown		mammal, turtle, fish
327	60 x 49 cm	25 cm			persimmon, sunflower	Baytown		mammal, bird, fish
376	38 x 30 cm	35 cm			grape, honey locust, persimmon, nuts, smartweed, maygrass	Baytown & Grit	flakes, abrader, flakes	mammal, turtle, fish
4198	65 x 63 cm	20 cm			sumac, maygrass, smartweed			mammal, bird
433	52 x 39 cm	19 cm			hickory, walnut, pecan, acorn, persimmon, maygrass,	Indet. Miss.	flakes	mammal, UNSD, turtle, fish
690	50 x 49 cm	10 cm				Baytown		mammal
728	40 x 32 cm	20 cm				Baytown	flakes	mammal, turtle, fish
750	40 x 39 cm	16 cm				Baytown	projectile point	
756	40 x 41 cm	13 cm	Structure 4*			Baytown		mammal, turtle, fish
801	38 x 35 cm	33 cm				Baytown		
824	48 x 45 cm	22 cm				Baytown	flakes	
936	42 x 30 cm	8 cm				1 Baytown Plain	1 flake	

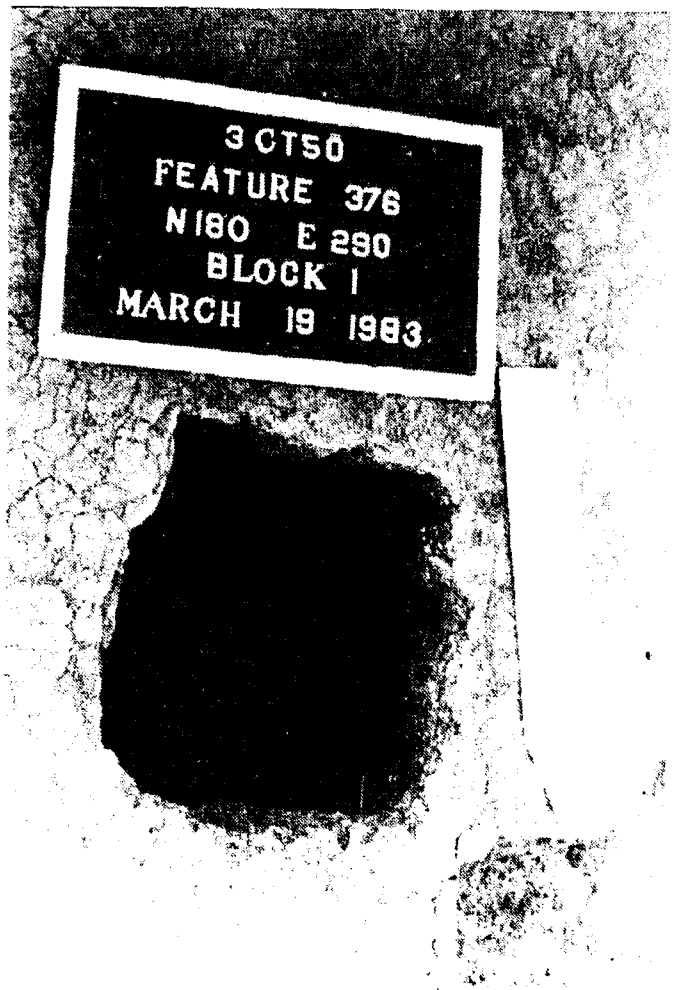


FIGURE 25. CATEGORY 2 BAKED CLAY FEATURE.

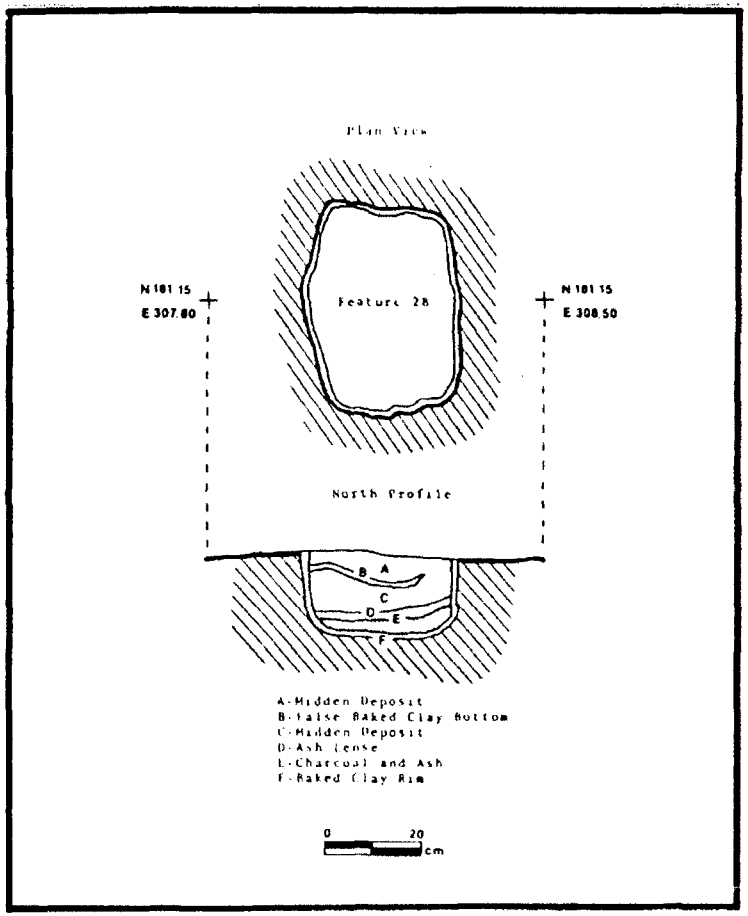


FIGURE 27. INTERNAL STRATIGRAPHY OF FEATURE 28 (CATEGORY 2, SQUARE OR RECTANGULAR BAKED CLAY PITS).

within this layer. Above the charcoal layer, the rest of the feature was usually filled in with black, midden-like soil that frequently contained floral remains, lithic debitage, fired clay lumps, and prehistoric ceramics. The charcoal and ash layer, combined with the heavily fired clay walls, reinforces the conclusion that intense fires were built inside of these features.

The second characteristic of Category 2 features is that many seem to form clusters, usually consisting of three baked clay pits, which are spaced at an average of between one and two meters apart. Where these features cluster, sometimes in association with Category 3 features (see below), the pits are generally in a straight line on a short arc. Over half of the features in Category 2 have been interpreted as feature clusters; the remaining Category 2 baked clay pits, which were scattered throughout Blocks 1 and 2, displaced no real evidence of clustering. More about the clustering of Category 2 (and Category 3) features will be presented later.

Most of the ceramics in Category 2 pits suggest a Baytown date for these features. Of the assemblage recovered from all Category 2 features, 87.6 percent are Baytown Plain and 11.9 percent are decorated (Table 9; for detail on Decorated see Appendix X, Table X-4). The only grit tempered plain body sherd constitutes less than one percent of the Feature Category 2 ceramic assemblage.

In addition to relative temporal placement, the baked clay rims and presence of a usually sealed and undisturbed layer of charcoal provided excellent opportunities for absolute dating. Radiocarbon dates were obtained on Category 2 Features 28 and 376, both of which were square. Comparative archeomagnetic dates were also obtained from the fired clay rims of these features. Details are presented in Appendices VI and VII and summarized below.

Feature 28 yielded a C-14 date of A.D. 646 and an archeomagnetic date of A.D. 750. Feature 376 yielded dates of A.D. 635 and A.D. 575 for the C-14 and archeomagnetic samples, respectively. Feature 28 contained no diagnostic artifacts. However, Feature 376 contained 27 ceramics of which 24 (88.8 percent) were Baytown Plain, one was a plain grit tempered sherd (3.7 percent), and two (7.4 percent) were cordmarked. Although the decorated wares differed in treatment, the sherds were classified as grog tempered Mulberry Creek Cordmarked, one with a fine, tight-wrap cord (Type A2) and the other a fine cross applied cord (Type A3).

The radiocarbon dates for Category 2 Features 28 and 376 are not only within an acceptable range of each other, they also fall within the span of time assumed to be represented by Baytown in the Central Valley. The archeomagnetic dates are a different story (Appendix VII). Feature 376 is one of only two such deposits that produced Alpha-95 values of less than 4°. In contrast, Feature 28 had an Alpha-95 value of 5.8°. The value, reliability and developmental

TABLE 9. CERAMICS RECOVERED FROM CATEGORY 2: SQUARE/RECTANGULAR BAKED CLAY PITS.

Feature Number	Crumbs/ Burnt Clay [gm]	Total Ceramics	Baytown Plain		Decorated		Grit Temper		Neeley's Ferry Plain		Sand Temper	
			#	%	#	%	#	%	#	%	#	%
27	-	11	9	81.8	2	18.1						
56	0/32	3	3									
318	0/30	1	1									
323	8/63	6	4		2							
325		6	6									
327	14/1047	26	22	84.6	3	11.5					1	3.8
376	23/124	27	24	88.9	2	7.4	1	3.7				
433	20/152	40	33	82.5	7	17.5						
690	8/419	26	23	88.4	3	11.5						
728	7/266	19	17	89.4	2	10.5						
730	-	2	1		1							
756	15/280	16	16									
801	29/416	22	20	90.9	2	9.1						
824	6/50	13	11	84.6	2	15.3						
906	0/338	1	1									

impression of archeomagnetic dating is discussed later in this report (Chapter Six). At this point, however, at least the C-14 dating has reinforced relative ceramic chronologies.

A single projectile point, recovered from Feature 730, comprises the diagnostic lithic assemblage for Category 2 features. This is a lanceolate, spike-like point which is usually classified as Early to Late Woodland (see Projectile Point Category Ii discussion, Appendix X). Flakes were also recovered from eight of the features in the category, and an abrader was found in Feature 419B (see Table 8).

A number of cultigens and one domesticate were recovered from Category 2 features (see Table 8; also Appendix III). Cultigens included maygrass, sumpweed, smartweed and chenopod. Feature 56 contained squash, but no other floral material.

Bone preservation was generally excellent and a wide variety of fauna are represented in Category 2 features (see Table 8; also Appendix IV). Large and small mammals were present and a considerable quantity of fish remains were also recovered.

The precise function of these Category 2 baked clay pits is unknown. Similar features have been found at sites within the Central Mississippi Valley. At Banks 5, near Wapannoca Lake, Perino (1966:4) encountered a single square pit that also had heavily baked clay sides. Perino noted that it contained Baytown ceramics, but identified no associated structure. He supposed, however, that the structure had existed, but had since been destroyed, making an inference that the baked clay feature at Banks 5 represented a central cooking/heating hearth for a house.

Klinger et al. (1983:271) encountered two square or rectangular baked clay features at nearby Brougham Lake (3CT98). These contained Baytown Plain ceramics and also were apparently unassociated with any of the structures defined at that site. A carbon-14 date of 780 $\pm$ 80 A.D. was obtained from one of the features, which also yielded an archeomagnetic date that was assessed at approximately 1200 A.D. Based upon the associated Baytown ceramics, Klinger et al. (1983) felt that the earlier date was more precise.

With regard to the fired clay sides of these features, Klinger et al. (1983:271) suggest:

> Although it is possible that the li: ing of these two features was merely fired in place, it does not appear likely, particularly in the case of Feature 83, which was well prepared and fired to an almost brick-like consistency.

Evidence gathered from 3CT50, however, indicates that the formation of the baked clay sides was not intentional, or prepared. During field work, a series of three square pits with a size and depth

approximately the averages for Category 2 features, were excavated into the sterile silt-clay matrix of the meander levee. Using a variety of canes and locally obtained wood, fires were constructed in two of these experimental pits. After burning down to coals, one fire was covered over with a layer of fine sand. Charcoal was used to create sustained heat in the remaining experimental pit. After several hours, all three pit sides exhibited an orange coloration similar to that observed in their prehistoric counterparts. Two days of continuous firing produced a thick (approximately two centimeters), fire-clay crust that was identical to the firing observed in the Category 2 features. The pit which had been sealed by sand possessed a similar fired clay crust in its bottom due to the retention of heat. This characteristic was not observed on the prehistoric features, which indicates that open fires were probably maintained, thus allowing heat to escape upward, or into the sides of the pits, rather than downward.

Because of these experiments we would have to add a third characteristic of the Category 2 baked clay features; the sides and clay rims were not prepared. In a number of cases, the fired clay walls of these pits, possessed a series of vertically oriented ripples, or undulations. These are interpreted to be the marks of digging sticks which were used to excavate the pits. Firing of the clay matrix preserved these marks in the walls of the features, whereas a fabricated clay lining would probably have obscured such marks.

As with the Klinger et al. (1983) findings at Brougham Lake, Category 2 features at 3CT50 do not appear to be directly related to structures of any kind. The exceptions are a possible association between Structure 1 and Feature 318; Structure 3 and Feature 323; and Structure 4 and Feature 756. Of these the association of Feature 756 and Structure 4 is probably the best.

At other Baytown sites within the Central Mississippi Valley, square or rectangular pits with baked clay rims occur sporadically, or not at all. Yet, excluding postholes, Feature Category 2 comprises a large percentage of the prehistoric pits recorded at 3CT50. The shear number of these features suggest that they were typical elements of prehistoric existence at this location.

Category 3: Round or Oval Baked Clay Pits

These 39 features are very similar to Feature Category 2 pits; however, the major morphological difference between the two categories is in their shape (Table 10). Rather than straight-walled or squarish, Category 3 features are basin shaped and round (Figure 28). Firing of the surrounding clay matrix is also evident.

In some cases, the heating appears to have been very intense as evidenced by baked clay crusts that approach three to four centimeters in thickness. More frequently, however, the firing of the clay matrix surrounding Category 3 features appears to have been less intensive

TABLE 10. CATEGORY 3: CIRCULAR OR OVAL BAKED CLAY PITS.
(Page 1 of 2)

FEATURE	DIMENSIONS	DEPTH	ASSOCIATION	DOMESTICATES	OTHER FLORAL	CERAMICS	LITHICS	FAUNAL
29A	45 x 40 cm	20 cm		squash	wild bean, persimmon, grape, maygrass, chenopod, smartweed			mammal, bird, fish
50	55 x 55 cm	24 cm			wild bean, composite, nuts, maygrass, smartweed	1 Baytown		mammal, bird, fish
59	30 x 28 cm	9 cm				2 Baytown Plain		UNMB, fish
61	60 x 50 cm	17 cm			grape, grass, maygrass	Baytown		turtle, fish
86	47 x 43 cm	16 cm	Structure 6*		wild bean, composite, persimmon, maygrass	Baytown	flakes	mammal, bird, fish
90	65 x 56 cm	18 cm	Structure 6*		maygrass, smartweed	Baytown	flakes	mammal, bird, fish
93	30 x 30 cm	6 cm	Structure 6*		maygrass, smartweed	Baytown	flakes	
94	53 x 45 cm	27 cm	Structure 6*		maygrass	1 Baytown Plain	flakes	UNMB, fish
195	60 x 50 cm	24 cm						UNMB, UNBB, fish
228	44 x 39 cm	16 cm	Structure 6		hickory	Baytown	flakes	UNMB, turtle
294	45 x 36 cm	14 cm		maize	sumpweed	Baytown		UNMB, UNBB, fish
295	55 x 31 cm	31 cm		squash	grape, persimmon, nuts, sunflower, maygrass	Baytown	abrader, flakes	mammal, bird, turtle, fish
299	79 x 66 cm	21 cm			hickory, pecan, acorn, maygrass	Baytown	flakes	mammal, fish
300	75 x 62 cm	21 cm	Structure 1*		persimmon, hickory	Baytown & Grit	flakes	mammal, turtle, fish
306	73 x 73 cm	33 cm	Structure 7*	maize/squash	wild bean, grass, persimmon, maygrass, smartweed, hickory	Baytown & Grit	flakes	mammal, turtle, fish
316	42 x 30 cm	20 cm	Structure 7*		hickory	Baytown		mammal, fish
317	36 x 32 cm	38 cm	Structure 7*		honey locust, maygrass	Baytown & Grit	flakes	mammal, turtle, fish
331	54 x 53 cm	36 cm	Structure 7*		hickory, pecan, acorn, maygrass	Baytown	flakes	mammal, bird, fish
332	53 x 45 cm	19 cm			hickory, pecan, walnut, acorn, wild bean, maygrass	Baytown	flakes	mammal only

TABLE 10. CATEGORY 5: CIRCULAR OR OVAL BAKED CLAY PITS.
(Page 2 of 2)

FEATURE	DIMENSIONS	DEPTH	ASSOCIATION	DOMESTICATES	OTHER FLORAL	CERAMICS	LITHICS	FAUNAL
343	71 x 71 cm	14 cm	Structure 7/5*			Baytown	flakes	mammal, bird, fish
365	39 x 37 cm	13 cm	Structure 3*			Baytown	flakes	
380	65 x 62 cm	22 cm		maize	hickory, pecan, walnut, acorn, maygrass	Baytown	flakes	mammal, bird, fish
417	47 x 42 cm	51 cm				Baytown	flakes	mammal, turtle, fish
419A	65 x 61 cm	20 cm		squash	sumac, maygrass, smartweed	Baytown	flakes	mammal, turkey, fish
656	77 x 70 cm	39 cm			honey locust, persimmon, nuts, sunflower, maygrass, smartweed	Baytown	3 cores, flakes	mammal, reptile, fish
657	59 x 54 cm	17 cm				Baytown	flakes	mammal, turtle, fish
659	83 x 66 cm	38 cm			grape, grass, hickory, pecan, acorn, sumpweed, maygrass	Baytown	flakes	mammal, turtle, fish
6844	68 x 64 cm	15 cm			hickory, pecan, walnut, acorn, maygrass	Baytown	1 flake	mammal, fish
694	63 x 60 cm	21 cm				Baytown		fish only
729	70 x 61 cm	28 cm			blackberry, persimmon, nuts, maygrass, sunflower	Baytown & Grit		mammal, turtle, fish
732	49 x 29 cm	11 cm	Structure 1*				flakes	UNMB, turtle, fish
748	56 x 44 cm	18 cm			hickory, acorn	Baytown	flakes	mammal, fish
749	53 x 41 cm	16 cm				Baytown		deer only
780	56 x 55 cm	10 cm				crumbs only	flakes	
827	54 x 21 cm	21 cm				Baytown & Grit		
829	53 x 53 cm	11 cm				Baytown	flakes	
844	58 x 43 cm	4 cm				1 Baytown Plain		
900	66 x 45 cm	16 cm				Baytown		
1001	78 x 76 cm	13 cm	Structure 3*			Baytown & Grit	flakes, tools	1 unionid

FIGURE 28. CATEGORY 3 BAKED CLAY FEATURE.

than in Category 2 features and may be due to differences in their respective shapes; function is a possible, but less likely cause of the differences in firing. The shallow, basin-shaped morphology of Category 3 features would have allowed heat from fires to dissipate upward more readily. The bottoms and sides of these features would have been subjected to less heat, and firing of the clay matrix would, therefore, have been less intensive.

Categories 2 and 3 represent a good example of the conservative approach taken during the feature categorization. Although differences occur, the internal stratigraphy of Category 3 features was very similar to those in Category 2 features. A layer of charcoal and ash beneath what is probably filled-in midden was typical of the stratigraphy in many of these features. Several pits exhibited evidence of multiple use. Successive layers of charcoal, ash and midden were found in at least three of the deeper examples of Category 3 features (Figure 29).

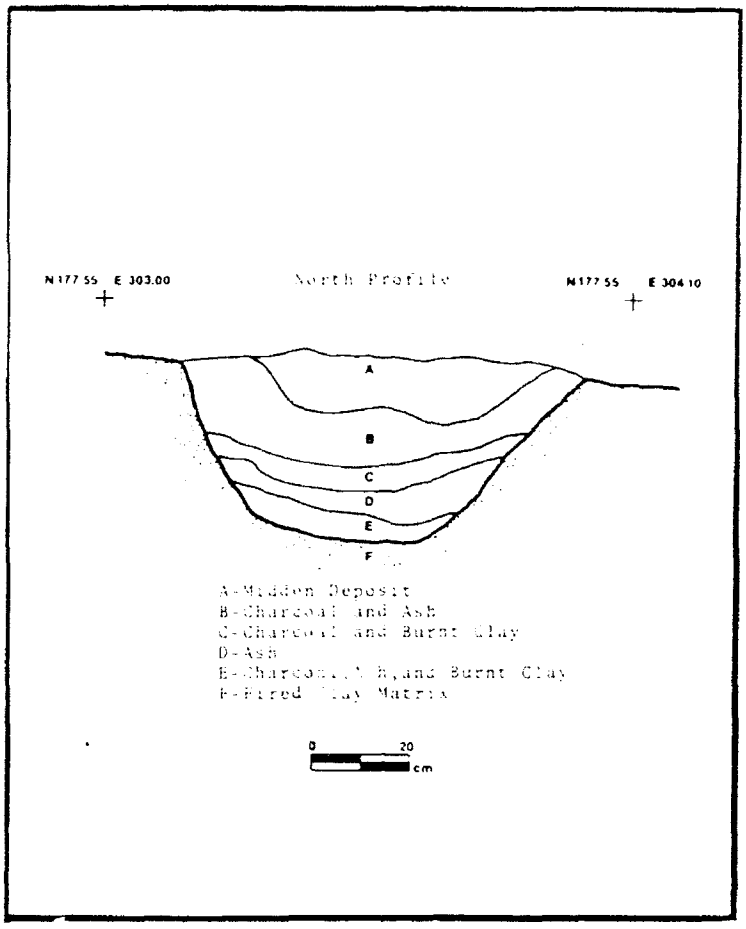


FIGURE 29. CROSS-SECTION PROFILE OF A CATEGORY 3 BAKED CLAY FEATURE (FEATURE 659).

In some instances the differences in shape between features classified as Category 2, and those classified as Category 3 features were not distinct. Several Category 3 features appeared very much like rectangles with rounded edges, and these were somewhat difficult to classify. In other cases, the distinction between shapes was much more obvious. This vagueness of shape could represent a merging, or gradual adaptation of feature morphology to alterations in function, or some other process. Evidence suggests that there is a temporal difference between these feature categories, but other attributes suggest considerable continuity with regard to their probable function.

As with many Category 2 features, Category 3 baked clay pits were found to occur in isolation as well as in feature clusters. Twelve Category 3 features were grouped into three separate clusters. One of these clusters was comprised of four baked clay features, while the remaining two clusters were made up of three features each.

Five Category 3 features were selected for archeomagnetic dating. While two of the dating samples yielded points that were off existing curves, three, Features 294, 295, and 300, produced estimates of between A.D. 620 to 640, good Baytown assignment.

Ceramics associated with Category 3 features reveal a higher incidence of grit tempered ceramics, as well as Baytown Decorated sherds (Table 11) than was recovered from Category 2 samples. This suggests that Category 3 features date slightly later than the predominately Baytown Plain ceramic assemblage recovered from Category 2 (refer back to Table 9). The suggestion that Category 3 features are temporally later than Category 2 is also supported by two other factors. First, the intrusion of circular baked clay pits into square or rectangular baked clay pits, were observed in at least two instances (684A into 730; 419A into 419B).

Second, there is an increased incidence of the carbonized remains of maize and squash in Category 3 over Category 2. A single squash rind was recovered from Category 2 feature; obversely six Category 3 features yielded domesticates. Category 3 features 294 and 380 yielded maize remains, while Feature 306 yielded both maize and squash. Squash was also recovered from Features 29A, 295, and 419A (see Table 10; see also Appendix III). Eighteen Category 3 features yielded carbonized seeds that may have been conscientiously harvested: maygrass; smartweed; sunflower; sumpweed; and chenopod.

As with Category 2 features, a number of Category 3 baked clay pits produced large amounts of animal bone. Again, both large and small mammals were represented, as well as a profusion of fish remains (see Table 10; see also Appendix II). However, while some Category 3 features yielded faunal, floral, ceramic and lithic artifacts in quantity, other baked clay features produced virtually no cultural material. This difference in content was probably related to the practice of periodically cleaning-out, or re-excavating these pits. As Figure 29 illustrated, use of these features resulted in a gradual accumulation of trash at their bases, which would have required periodic cleaning, or abandonment of the feature.

Category 4: Shallow, Basin-Shaped Pits

Fifty-two features were classified as shallow basins, making Category 4 the largest single group of prehistoric features (excluding, of course, posts). The majority were oval or circular and exhibited a rounded or basin-shaped cross-section. None were characterized by internal stratigraphy and there was no evidence of firing.

Compared to other prehistoric pits encountered on the site, Category 4 features were relatively shallow, in relation to their breadth, or size (Table 12). The deepest pit was 34 cm and measured 230 cm by 77 cm in plan view. The shallowest Category 4 feature measured only five centimeters deep.

TABLE 11. CERAMICS RECOVERED FROM CATEGORY 3: CIRCULAR OR OVAL BAKED CLAY FEATURES.

Feature Number	Crumbs/ Burnt Clay [gm]	Total Ceramics	Baytown Plain		Decorated		Grit Temper		Neeley's Ferry Plain		Sand Temper	
			#	%	#	%	#	%	#	%	#	%
50	5/143	14	14									
59	2/0	2	2									
61	13/269	10	7	70.0	3	30.0						
86	7/135	10	8	80.0	2	20.0						
90	50/145	29	24	82.7	5	17.2						
93A	0/112	25	25									
94	0/114	1	1									
195	8/44	12	7	58.3	5	41.6						
228	4/15	6	6									
294	4/756	6	4		2							
295	55/1593	52	47	90.3	5	9.6						
299	14/245	14	13	92.8	1	7.1						
300	22/0	22	10	45.4	5	22.7	7	31.8				
306	56/291	65	56	86.2	5	7.7	4	6.1				
316	5/84	6	5		1							
317	11/571	44	35	79.5	8	18.2	1	2.3				
331	2/230	28	25	89.3	3	10.7						
332	7/216	30	24	80.0	6	20.0						
343	22/488	23	20	86.9	3	13.0						
363	8/33	8	7		1							
380	8/73	11	11									
417	23/147	33	29	87.8	4	12.1						
419	8/1210	30	25	83.3	5	16.7						
656	23/132	35	30	85.7	5	14.2						
657	1/146	10	7	70.0	3	30.0						
659	20/264	35	27	77.1	8	22.8						
684A	32/83	26	24	92.3	2	7.6						
694	20/194	21	18	85.7	3	14.3						
729	16/106	48	37	77.0	11	22.9						
748	<1/576	16	11	68.7	5	31.2						
749	3/521	14	11	78.5	3	21.4						
827	0/894	5	4								1	
829	4/0	8	4		4							
844	0/37	1	1									
900	115/486	64	49	76.5	15	23.4						
1001	19/243	31	26	83.8	4	12.9	1	3.2				

TABLE 12. CATEGORY 4: SHALLOW BASIN-SHAPED PITS.
(Page 1 of 2)

FEATURE	DIMENSIONS	DEPTH	ASSOCIATION	DOMESTICATES	OTHER FLORAL	CERAMICS	LITHICS	FAUNAL
298	60 x 55 cm	-		squash	maygrass, chenopod, smartweed			
78	50 x 50 cm	13 cm			persimmon, maygrass, chenopod, smartweed	1 Baytown Plain	flakes	UNMB, turtle, fish
82	64 x 64 cm	10 cm				no ceramics	flakes	UNMB, fish
85	54 x 47 cm	11 cm	Structure 6*				flakes	UNMB only
199	76 x 65 cm	10 cm			hickory, pecan, acorn, sunflower			UNMB, fish
208	60 x 56 cm	18 cm		squash		1 Baytown Plain		
212	30 x 66 cm	16 cm	Structure 6*		hickory, pecan, walnut	Baytown	flakes	
254	130 x 97 cm	28 cm				3 Baytown Plain	projectile point	UNMB
256	130 x 120 cm	9 cm				6 Sand/Grit	flakes, tool	
258	98 x 90 cm	15 cm						muskrat, bowfin
259	46 x 45 cm	11 cm			hickory, walnut, acorn		flakes	UNMB only
267A	50 x 37 cm	17 cm			hickory, pecan, acorn	Indet. Miss.	flakes	mammal, bird, fish
274A	79 x 36 cm	26 cm						
284	73 x 60 cm	29 cm	Structure 1*		persimmon, hickory	Baytown & Grit	flakes	UNMB, fish
286	55 x 36 cm	22 cm	Structure 1*			1 Baytown Plain	flakes	
287	85 x 45 cm	18 cm	Structure 1*				flakes	UNMB, fish
289	54 x 31 cm	19 cm	Structure 1*		walnut		flakes	UNMB, UNBB, fish
290	50 x 45 cm	21 cm	Structure 1*		persimmon, hickory, pecan, walnut, acorn	Baytown	flakes	
302	74 x 53 cm	20 cm			hickory, chenopod, maygrass	Baytown, Indet. Miss. & Grit	flakes	mammal, bird, turtle, fish
305A	100 x 75 cm	14 cm						
324	61 x 50 cm	16 cm			grape, maygrass, hickory, pecan	Baytown	core, flakes	mammal, fish
330	85 x 57 cm	20 cm	Structure 7*		persimmon, maygrass, hickory, pecan, acorn	Baytown	flakes	mammal, reptile, fish
408	55 x 54 cm	12 cm			maygrass	4 Baytown Plain		UNMB, fish
410	60 x 55 cm	6 cm				5 Baytown Plain	flakes	UNMB, fish
411	65 x 61 cm	8 cm			honey locust	3 Baytown Plain		UNMB, turtle, fish
412	68 x 67 cm	20 cm				Baytown		UNMB, turtle, fish

TABLE 12. CATEGORY 4: SHALLOW BASIN-SHAPED PITS.
(Page 2 of 2)

FEATURE	DIMENSIONS	DEPTH	ASSOCIATION	DOMESTICATES	OTHER FLORAL	CERAMICS	LITHICS	FAUNA
413	91 x 83 cm	30 cm			persimmon, nuts, maygrass, smartweed	Baytown	biface	mammal, turtle, fish
428	54 x 53 cm	11 cm			hickory, acorn, maygrass	Baytown		UNMB, fish
435	44 x 43 cm	11 cm				1 Baytown Plain		
613	80 x 76 cm	17 cm					flakes	UNMM, UNBB
625	142 x 88 cm	22 cm	cache				flakes, tools	
635	95 x 45 cm	20 cm	Structure 7*		persimmon	4 Baytown Plain	flakes	
650	100 x 60 cm	15 cm			grass, maygrass, hickory, walnut	1 Baytown Plain	flakes	mammal, UNBB, turtle, fish
682	19 x 17 cm	15 cm				4 Baytown Plain	pitted cobble	mammal, turtle, fish
685	70 x 70 cm	25 cm				Baytown, Grit, and Sand	flakes	
689	68 x 60 cm	20 cm				Baytown	flakes	mammal, bird, fish
705A	104 x 87 cm	25 cm				crumbs only		UNMB, fish
738	40 x 38 cm	15 cm				Baytown		
746	61 x 57 cm	19 cm	Structure 1*		hickory, pecan, acorn, maygrass	Baytown	flakes	mammal, turtle, fish
760	35 x 35 cm	8 cm			chenopod, wild bean, sunflower, maygrass	1 Baytown Plain		
768	79 x 59 cm	15 cm	Structure 4*			8 Grit temper	flakes	
790	51 x 48 cm	6 cm			hickory, acorn	Baytown		UNMB, bird, turtle, fish
798	45 x 36 cm	13 cm			hickory, walnut			UNMB, turtle, fish
800	45 x 38 cm	5 cm			hickory	1 Baytown Plain		
803	72 x 70 cm	10 cm				4 Baytown Plain	pitted cobble	
807	40 x 33 cm	15 cm				Baytown		
822	46 x 43 cm	6 cm				Baytown		
841	210 x 77 cm	34 cm				Baytown & Grit	flakes, tool	
842	116 x 96 cm	24 cm				Baytown & Grit		
843	46 x 41 cm	16 cm			hickory			mammal only
907	50 x 37 cm	22 cm						
1003	62 x 62 cm	27 cm			maygrass, wild bean, persimmon, hickory	Baytown & Grit	flakes	mammal, turtle, fish

The contents of these pits was variable. Only two features, 29B and 208, were found to contain any remains of domesticated plants; however, cultigens were present in 13 of these pits and included chenopod, maygrass, smartweed, and sunflower. Evidence for the wild plant foods included an abundance of hickory, pecan, walnut and acorn in addition to persimmon, honey locust, grape and wild bean (Table 12; see also Appendix III).

Faunal remains were present in 25 of the 51 features that are included within Category 4. Various species of fresh water fish are represented, as are amphibians, birds, reptiles, bi-valves and large and small mammals (see Table 12; see also Appendix II).

Ceramic artifacts were well represented in Category 4 features (Table 13). A total of 770 sherds, including 640 Baytown Plain (83.8 percent), 102 Baytown Decorated (13.3 percent), and 23 grit tempered sherds (2.9 percent) comprise the ceramic assemblage from these features. Also present were two (0.3 percent) Neeley's Ferry Plain sherds, and three (0.4 percent) Barnes plain sherds (see Appendix X Ceramic Analysis). This assemblage would seem to temporally place at least some of the Category 4 features in association with the Late Baytown/Mississippian occupation of the site.

Lithic artifacts included broken bifaces, cores and groundstone tools (see Appendix X: Tables X-5, X-9). Small numbers of lithic debitage were present also that are probably the products of edge resharpening. Feature 625, although similar in shape and size to other Category 4 features, differed with regard to content. It contained only lithic artifacts which appear to represent a small cache. Included in the cache were one projectile point, two bifacial preforms, one bifacial scraper, two unexhausted cores, and several large utilized flakes.

The projectile point found in Feature 625 is similar to the Big Creek type that is defined by Morse (1970) and suggested to be associated with the Late Archaic period. Although the absence of ceramics and certain floral remains, as noted above, might suggest an Archaic association for this feature at 3CT5C, our data neither confirm nor deny such chronological placement.

Category 4 features were scattered throughout Blocks 1 and 2. While associations of some of these pits with house patterns are hypothesized, in general it is difficult to substantiate such relationships. Exceptions are three clustered Category 4 features that form an arc parallel to the inside wall of Structure 1. The association between these three features (286, 287, and 289) and Structure 1 seems to be fairly good and is examined further in subsequent discussions of Structure 1 and Feature Cluster 9.

The function of Category 4 features is difficult to interpret. Although certain morphological similarities to so-called trash pits exist, we do not believe the pits were purposefully excavated to

TABLE 13. CERAMICS RECOVERED FROM CATEGORY 4: SHALLOW BASIN SHAPED PITS.

Feature Number	Crumbs/ Burnt Clay [gm]	Total Ceramics	Baytown Plain		Decorated		Grit Temper		Neeley's Ferry Plain		Sand Temper	
			#	%	#	%	#	%	#	%	#	%
78	5/37	1	1									
208	2/36	1	1									
212	3/6	5	4		1							
254	3/9	3	3									
267	0/10	5	4		1							
284	2/8	3	2				1					
290	13/36	22	20	90.9	2	9.1						
302	34/169	54	42	77.7	7	12.9	1	1.8	2	3.7	2	3.7
324	4/31	8	4		4							
330	42/189	52	49	94.2	3	5.7						
408	4/34	4	4									
410	0/11	3	3									
411	0/25	3	3									
412	5/37	9	9									
413	63/1394	45	39	86.6	6	13.3						
428	0/58	6	6									
435	0/9	1	1									
635	1/4	4	4									
650	3/6	1	1									
682	12/36	4	4									
685	24/168	49	40	81.6	7	14.3	1	2.0			1	2.0
689	0/48	16	16									
738	0/9	1			1							
746	3/45	15	11	73.3	4	26.6						
768	3/0	5					5					
790	0/4	4	2		2							
800	-	1	1									
803	2/21	4	4									
807	38/144	54	51	94.4	3	5.5						
822	1/23	5	5									
841	252/1551	259	212	81.9	38	14.7	2	.7			7	2.7
842	113/1128	127	103	81.1	23	18.1	1	.7				
1003	26/184	26	23	88.4	2	7.7					1	3.8

dispose of garbage. Rather, the filling in of these pits with refuse was probably a secondary usage once their primary function had expired. Storage facilities and possibly resting basins for large, globular Baytown vessels are potential explanations for the function of Category 4 features.

Category 5: Straight-Walled, Deep Pits

Only six pits fall into this category which is marked by features with straight walls and flat, or slightly rounded bases (Table 14). The largest pit in this category measured 63 cm by 57 cm and 27 cm deep, while the smallest was 40 cm by 38 cm, but 36 cm deep. None of the features displayed evidence of burning or firing.

The contents of Category 5 features was somewhat variable. A bipolar core was recovered from Feature 403 and Feature 747 yielded a marginally retouched flake tool in addition to three interior flakes and 28 shatter pressure flakes. One interior flake was recovered from Feature 218A and seven shatter pressure flakes from Feature 660. Ceramics consisted primarily of Baytown Plain (Table 15), however, Feature 903 contained both grit tempered and Neeley's Ferry Plain sherds. With the exception of Feature 903, domesticated plant remains were entirely lacking. Feature 903 contained one fragment of a maize kernel, in addition to maygrass and persimmon. Maygrass was also recovered from Features 660, 747 and 812A. Other food remains include small amounts of hickory, pecan and walnut shells, and acorn (Table 14; also Appendix III).

Faunal remains were present in five features. Fish remains dominated the collections, though mammal, bird, and reptile were also present (Table 14; also Appendix II).

Category 5 features are widely spaced throughout Blocks 1 and 2. No clear relationships with the possible house patterns were observed. It is probable, based on their general shape, that these pits functioned as storage facilities. Several Category 5 features, however, appear to have been filled in with refuse, but as noted above, it is unlikely that this was their primary purpose.

Category 6: Large Bell-Shaped Pit

A single pit, Feature 102, makes up Category 6. It is a large (110 cm by 110 cm by 70 cm), oval, straight-sided pit that "bells-out" near its bottom. Internal stratigraphy is completely lacking, and the feature contents were sparse.

Lithics include a single battered cobble (hammerstone), and 21 interior or shatter/pressure flakes. Ceramics included only Baytown Plain (N=33) but ceramic crumbs and burnt clay was also present. The floral and faunal assemblages were restricted, and included only persimmon, maygrass, unidentified mammal bone and fish remains.

TABLE 14. CATEGORY 5: STRAIGHT-WALLED, DEEP PITS.

FEATURE	DIMENSIONS	DEPTH	ASSOCIATION	DOMESTICATES	OTHER FLORAL	CERAMICS	LITHICS	FAUNAL
218A	55 x 49 cm	41 cm					1 flake	
403	63 x 57 cm	27 cm			hickory, pecan, walnut, acorn	Baytown & Grit	Bipolar core	mammal, UNBB, fish
660	40 x 38 cm	36 cm	Category 5/1		wild bean, persimmon, maygrass	Baytown	flakes	mammal, UNBB, fish
747	57 x 48 cm	28 cm			grass, maygrass, sumpweed	Baytown	flakes, tool	mammal, bird, fish
812A	43 x 42 cm	43 cm			hickory, acorn, maygrass			UNMB, fish
903	46 x 42 cm	29 cm		maize	persimmon, maygrass	Baytown, Miss., & Grit		mammal, bird, reptile, fish

TABLE 15. CERAMICS RECOVERED FROM CATEGORY 5: STRAIGHT-WALLED DEEP PITS.

Feature Number	Crumbs/ Burnt Clay [gm]	Total Ceramics	Baytown Plain		Decorated		Grit Temper		Neeley's Ferry Plain		Sand Temper	
			#	%	#	%	#	%	#	%	#	%
403	27/163	42	37	88.0	5	11.9						
660	4/25	9	8		1							
747	8/35	9	8		1							
903	14/44	39	30	76.9	3	7.7	2	5.1	4	10.2		

Feature 102 is distinctly different from all other features found on the site. It is the deepest pit encountered, extending 70 cm. The function of this feature is unknown, but its shape suggests that it served as some type of storage facility.

Category 7: Large Basin-Shaped Pits

Only one feature, 257, is included in this category. Situated at the south end of Excavation Block 1, near the base of the meander levee, the feature is a large, somewhat irregularly shaped pit that measured 126 cm by 109 cm. It was 45 cm deep and was filled with a dark silty clay soil. No internal stratigraphy was observed during excavation.

The contents of Feature 257 are distinct from others at the site. The ceramic assemblage is comprised of four grit tempered sherds, a sand tempered piece, and one punctate rim. A bi-conically shaped baked clay ball was also recovered from this feature. The presence of fired clay balls, similar to those which are commonly associated with the Poverty Point culture, is not unusual in an apparently Baytown context. Baked clay objects are known to occur at later sites throughout the Mississippi River Valley. Morse and Morse (1983) mention clay balls in association with Early and Middle Woodland sites in northeast Arkansas. They suggest that these may have functioned as heating elements in earth ovens, used in the place of stone.

However, Morse and Morse (1983) also note the presence of baked clay objects at the McCarty site, a Pascola phase Tchula component. In addition, that site produced punctated ceramics and extensive sand tempering among the sherd collection. Although it is possible this feature (257) could be a similar Tchula deposit, we feel that the low incidence of baked clay objects, and presence of grit tempered sherds are more suggestive of Baytown.

Lithic flake debitage was more numerous (N=82) in this feature than in most others. Among the 82 interior and shatter/pressure flakes, a variety of raw materials were noted including: Lafayette, Boone, Pitkin, Everton and Jefferson cherts. Most of the flakes were small and are probably the products of resharpening the edges of chipped stone tools. A single flat, facetted abrader fragment, made of fine grained sandstone was also recovered.

Floral remains included 64 hickory nut shells and a small number of acorn shell fragments. One white-tailed deer phalangia was also present, along with small amounts of unidentified mammal bone and fish.

Located on the lower levee slopes, Feature 257 might have been a trash pit. Alternatively, the distinctive array of contents combined with its isolated position relative to the main concentration of features in both Blocks 1 and 2 could indicate its use was unrelated to other Baytown occupations at the site.

Category 8: Burial Pits

Four features were found to contain human interments (Table 16). Two of these burial pits were elongated troughs, one was a large oval, and the remaining burial pit was so badly disturbed by a drainage ditch that its precise shape could not be determined.

TABLE 16. CATEGORY 8: BURIAL PITS.

FEATURE	DIMENSIONS	DEPTH	ASSOCIATION	DOMESTICATES	OTHER FLORAL	CERAMICS	LITHICS	FAUNAL
654	163 x 60 cm	22 cm			maygrass	Indet. Miss.	flakes, tool	mammal, turtle, fish
658	127 x 56 cm	20 cm			grass, persimmon, sumpweed, maygrass	Baytown & Grit	flakes	
788	n/a	n/a				Indet. Miss.	flakes	mammal, bird, fish
905	115 x 60 cm	20 cm			sumac	Baytown		mammal, bird, reptile, fish

TABLE 17. CERAMICS RECOVERED FROM CATEGORY 8: BURIAL PITS.

Feature Number	Crumbs/ Burnt Clay [gm]	Total Ceramics	Baytown Plain #	Baytown Plain %	Decorated #	Decorated %	Grit Temper #	Grit Temper %	Neeley's Ferry Plain #	Neeley's Ferry Plain %	Sand Temper #	Sand Temper %
654	53/185	25	20	80.0	4	16.0			1	4.0		
658	10/34	22	15	68.1	7	31.8						
788	2/24	12	9	75.0	2	16.6					1	8.3
905	97/352	63	60	95.2	3	4.7						

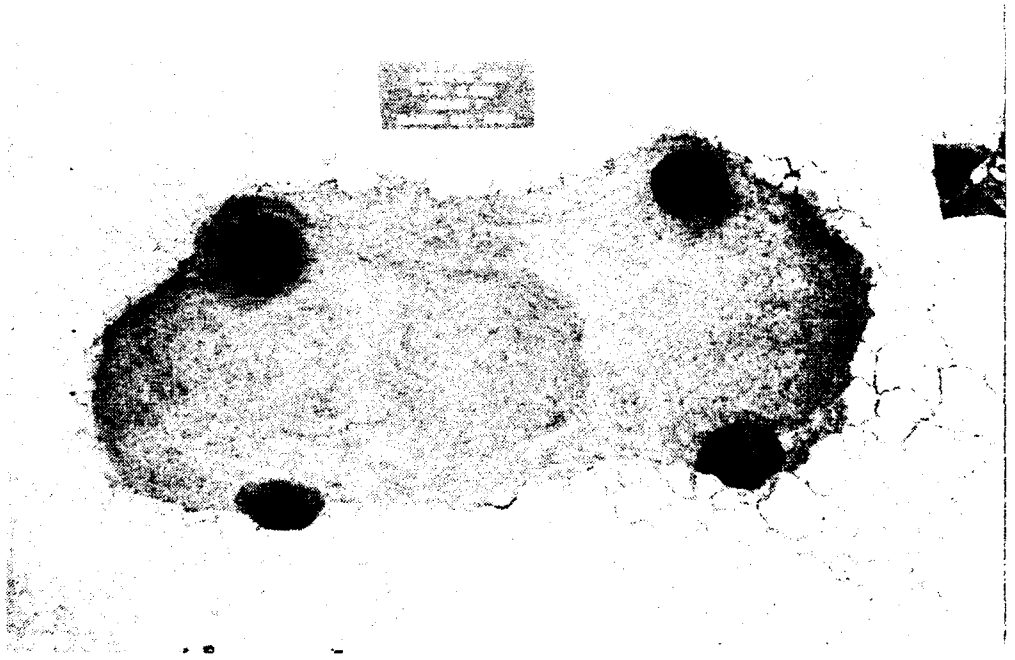
Feature 658 is a shallow, oval pit that contained the flexed remains of an adult male. This feature measured 127 cm by 56 cm and intruded into three tightly clustered circular, baked clay pits (Figure 30a).

Features 654 and 905 were elongated, trough-shaped pits. Feature 654 contained the extended skeleton of a juvenile and was associated with four postholes (Figure 30b). These may have supported a grave-marker, or small charnel structure (see discussion of Structure 2). Feature 905 contained the extended remains of a young adult female and an unborn fetus (Figure 31). This pit was intruded into the top of Feature 906, a square, baked clay pit.

FIGURE 31. VIEW OF FEATURE 905.

Feature 788 contained the badly disturbed remains of an adult male. The burial pit had been almost completely destroyed by the construction of a field road and drainage ditch. Cultivation had also severely affected the condition of this feature, and hence, very little can be said about its shape and appearance.

A.



B.

FIGURE 30. FEATURES 658 AND 654 (CATEGORY 8: BURIAL PITS).
A) Feature 658; B) Feature 654

Radiocarbon dates were obtained on three of the four burials. The burial in Feature 654 yielded a date of A.D. 1000 (see Appendix VI for detail), and Feature 658 was dated to A.D. 1030. The latest date, A.D. 1213, was from the burial in Feature 905. These dates would suggest that the burials should date to the late Baytown or Mississippian. The ceramic assemblages from the features, however, and with the exception of the single piece of Neeley's Ferry Plain from Feature 654, suggest Baytown (see Table 17). The apparent discrepancy may lie with the overall conservative nature of the ceramic assemblage, which throughout the various occupations at the site, evidences little in the way of experimentation.

The contents of these burial pits were variable. Features 654 and 788 contained animal bone, including mammals and especially the remains of fish (see Appendix II); Feature 905 contained, however, a wide diversity of faunal materials. The floral assemblage recovered was somewhat unexpected in light of other findings. None yielded evidence of domesticates and with the exceptions of the maygrass from Features 654 and 658, and sumpweed from Feature 658, only wild foodstuffs were recovered (grass, persimmon and sumac).

Three features (654, 658 and 788) contained small amounts of lithic debitage, but no lithics were associated with Feature 905. Feature 654, in addition to 89 flakes, contained a single biface fragment.

Category 9: Trenches and Trough-Shaped Pits

Four features, 30, 351, 691, and 769, are included in this category (Tables 18 and 19; Figure 32). In appearance, three of the features were similar in shape to the Feature 654 and 905 burial pits described above. Because of this, it was initially believed that these pits (30, 351 and 691) were the locations of primary interments that were exhumed and redeposited as bundle burials at other locations. Perino's (1966, 1967) excavations at the nearby Banks Site, produced a number of secondary bundle burials in association with a low Baytown mound.

Subsequent examination of the data suggest that Category 9 features were probably not burial pits. First, the Category 9 pits in question are much larger than the two Category 8 elongated burial pits. And, second, absolutely no trace of human bone was recovered from any of the three.

All three features exhibited slight evidence of burning or firing of the surrounding clay matrix. This was especially true of Feature 30. The contents of these features tended to vary. Lithics were recovered from each, however Feature 351 yielded 156 lithics, one of the highest totals at the site. Also included with that assemblage was an adze. Ceramics recovered from Features 351 and 691 suggest either Late Baytown or early Mississippian use of both (Table 19).

TABLE 18. CATEGORY 9: TRENCHES AND TROUGH-SHAPED PITS.

FEATURE	DIMENSIONS	DEPTH	ASSOCIATION	DOMESTICATES	OTHER FLORAL	CERAMICS	LITHICS	FAUNAL
30	300 x 90 cm	28 cm			hickory	no ceramics	flakes, scraper	UNMB, fish
351	265 x 62 cm	29 cm			wild bean, persimmon, hickory, pecan, walnut, acorn	Indet. Miss.	flakes, adze	
691	n/a x 118 cm	30 cm			hickory, maygrass	24 Grit temper	flakes	UNMB, fish
769	230 x 51 cm	16 cm		Maize	persimmon	Baytown, Miss., & Grit	flakes, tools	

TABLE 19. CERAMICS RECOVERED FROM CATEGORY 9: TRENCHES OR TROUGH-SHAPED PITS.

Feature Number	Crumbs/ Burnt Clay [gm]	Total Ceramics	Baytown Plain		Decorated		Grit Temper		Neeley's Ferry Plain		Sand Temper	
			#	%	#	%	#	%	#	%	#	%
351	185/558	321	268	83.5	29	9.0			19	5.9	5	1.6
691	9/31	24					24					
769	29/68	46	42	91.3	2	4.3	1	2.2	1	2.2		

FIGURE 32. VIEW OF CATEGORY 9 FEATURE 351.

Bone was sparse in Features 30 and 691, and absent in Feature 30. The floral assemblage from each was dominated by nuts.

The function of Features 30, 691 and 351 is unclear. At Brougham Lake, Klinger et al. (1984:285-289) encountered a similar feature that contained Baytown Plain and Neeley's Ferry Plain sherds. In addition to ceramics, the pit yielded 509 unidentified mammal bones, and five kernels of corn. This feature measured 34 cm by 194 cm which, although narrower, is comparable in length to Features 30, 351 and 691 at 3CT50.

The element of burning or firing of the clay matrix may suggest a function similar to Feature Categories 2 and 3. While the intensity of firing is not nearly as great in the Category 9 features, other similarities exist between these features and the Category 2 and 3 feature clusters that are discussed later in this chapter.

Feature 769 contains three postholes and it is probable that this feature should have been placed in a separate category of its own. Forty-two (91.3 percent) Baytown Plain ceramic sherds, two (4.3 percent) Baytown Decorated, one (2.3 percent) grit tempered, and one (2.3 percent) mixed sand/shell tempered sherds were recovered from this feature. In addition, six kernels of maize were found. An Early, or indeterminate Mississippian association is suggested for this feature. The overlying sheet midden deposit found in this part of the site, also contained high frequencies of Mississippian ceramics. It may be that this feature represents the south wall of a Mississippian wall trench (see Structure 8 discussion).

Category 10: Amorphous Pits

These large, irregularly shaped features are distinguished only by that their lack of distinguishing characteristics (Table 20). Only one, Feature 92, may be associated with a structure. The remainder are dispersed throughout the Blocks 1 and 2 excavation areas. With the exception of Feature 430 which had a quantity of both Baytown and Mississippian ceramics, the features yielded little in the way of ceramic data useful in interpreting either their cultural or temporal affiliation (Table 21). Unlike some of the other feature classes, the faunal collection, as a whole, showed a strong presence of mammal over fish and minority elements. As for both lithics and floral remains, neither was exceptionally well represented.

Category 11: Surface Hearth

The single member of this category, Feature 87, is a small (44 cm by 30 cm), roughly circular area of consolidated fired clay detected in the central part of Excavation Block 2. It was covered by a thin layer of ash and charcoal and it does not appear to be associated with any structure patterns.

No cultural materials, other than burnt clay and a small quantity of unidentified mammal bone and fish were recovered from the feature, and the feature's function as a hearth is only hypothetical.

FEATURE PATTERNS

Eight structures were identified at 3CT50 and include: 1) six probable structures; 2) a grave marker or burial platform; and 3) a single segment of a wall trench. As used in this discussion, the term structure is not synonymous with domicile, but rather used to describe those arrangements of posts and features that were erected for specific purposes and have been designated in this report by structure numbers; six apparently date to the Baytown, while two may be later. The relative position and contents of features further indicate that Baytown living areas probably extended onto the levee crest, but outside the Corps ROW.

TABLE 20. CATEGORY 10: AMORPHOUS PITS.

FEATURE	DIMENSIONS	DEPTH	ASSOCIATION	DOMESTICATES	OTHER FLORAL	CERAMICS	LITHICS	FAUNAL
91	40 x 39 cm	5 cm						UNMB, fish
92	62 x 59 cm	7 cm	Structure 6*		maygrass	3 Baytown Plain	flakes	UNMB, fish
389	70 x 58 cm	13 cm				2 Baytown Plain	flakes	mammal, UNBB, turtle, fish
430	130 x 60 cm	7 cm			honey locust, persimmon	Baytown/Miss.	flakes	mammal, bird, reptile, fish
616	52 x 48 cm	6 cm				Baytown		
664	219 x 153 cm	12 cm				Baytown	flakes	UNMB, 1 fish scale
692	105 x 75 cm	5 cm			hickory, walnut, maygrass			UNMB only
737	48 x 43 cm	5 cm				2 Baytown Plain	flakes	
823	43 x 33 cm	4 cm				1 Baytown Plain	flakes	

TABLE 21. CERAMICS RECOVERED FROM CATEGORY 10: AMORPHOUS PITS.

Feature Number	Crumbs/ Burnt Clay [gm]	Total Ceramics	Baytown Plain #	Baytown Plain %	Decorated #	Decorated %	Grit Temper #	Grit Temper %	Neeley's Ferry Plain #	Neeley's Ferry Plain %	Sand Temper #	Sand Temper %
92	0/7	3	3									
389	1/6	2	2									
430	41/161	105	79	75.2	12	11.4			14	13.3		
616	3/3	4	3		1							
664	2/173	2	1		1							
737	6/84	2	2									
823	0/7	1	1									

In addition, clusters of features occur in likely association with some of the structures as well as in isolation throughout the stripped areas in Blocks 1 and 2; aspects of their appearance, category types, contents and distribution suggest some degree of deliberate preparation and arrangement by the site occupants. These occurrences are designated by feature cluster number and briefly considered with structure descriptions when an association seems plausible; however, each feature cluster is also described in the subsequent section.

Structures

Structure 1

This structure is located in the center of Excavation Block 1 (see Figure 25), and, measuring 5.85 m by 4.50 m, encompasses an area of approximately 26.3 sq m (Figure 33). Structure 1 was configured by 18 wall posts that were aligned in a slightly irregular, but readily definable oval pattern (Figure 33; Table 22).

Eight postholes may also be associated with the structure, possibly defining annex supports or interior divides. Features 733, 743, 744 and 745, along the northern margin, may define an annex enclosing a shallow basin pit and one, Category 3 baked clay pit. Features 272, 313 and 314 could have housed internal support posts, partition posts, or, in the case of Feature 314, an alternative wall post.

As noted above, four features lie within the structure. Three of these Feature Category 4 pits are located in the south, central portion of the structure's interior. This particular feature cluster (Cluster 9) is discussed subsequently in the chapter. The fourth Category 4 pit (Feature 290) contained a quantity of nuts, shell remains and carbonized wood, in addition to ceramics and lithics.

In proximity but outside the structure outline are five additional large features. Feature 318 was classified as a Category 2 feature, Features 300 and 732 were Category 3 baked clay pits and Features 284 and 746 are shallow, basin-shaped storage pits. The location of these features so close to the Structure 1 wall would seem to argue that one or the other group of features were in use either earlier or later in time. This would be especially true of Feature 318, which actually fell within the line of postholes that made up a section of the structure wall, and Features 746 and 732 which may be within the annex.

While temporal variation in the association of these baked clay features and Structure 1 may be plausible in some instances, functional considerations also have to be evaluated for certain of these features. There are several alternate ways of interpreting the others found to be typical occurrences in all areas of the site. One suggestion is that dwellings were erected and occupied during warm weather, necessitating the excavation of smudge pits for insect control, a prolific annoyance in the uncleared and undrained lowlands region. An open-sided building similar to the Seminole chikee may

TABLE 22. STRUCTURE 1 FEATURE ASSOCIATIONS.

Feature Function	Feature Category	Feature Number
Wall Postholes	1	267B
	"	269
	"	274B
	"	276
	"	277
	"	280
	"	281
	"	282
	"	283
	"	285
	"	291
	"	652
	"	665
	"	666
	"	667
	"	668
	"	736
	"	742
Associated Pits	4	286
	"	287
	"	289
	"	290
Potentially Associated Posts	1	272
	"	313
	"	314
	"	733
	"	743
	"	744
	"	745A
	"	745B
Potentially Associated Pits	2	318
	3	300
	"	732
	4	284
	"	746

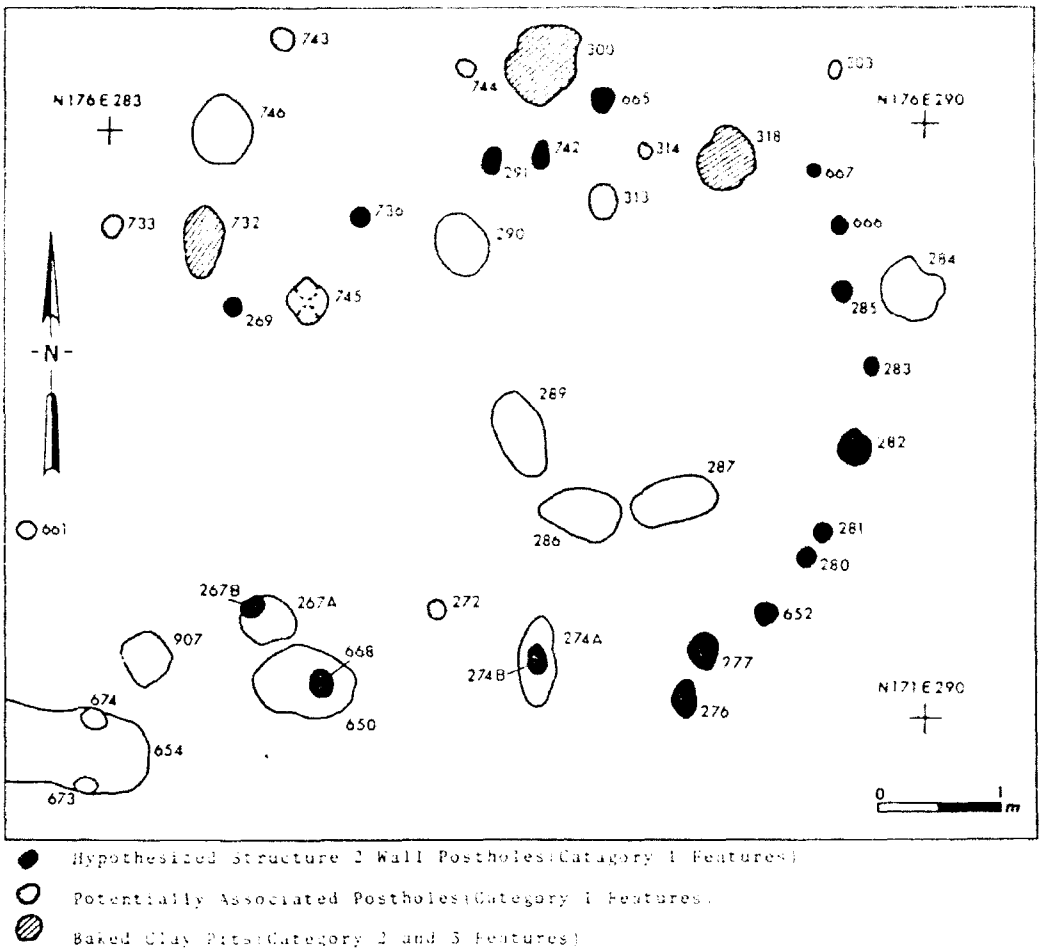


FIGURE 33. PLAN VIEW OF STRUCTURE 1.

have characterized the construction plan of these houses (see Hudson 1978:217). A low-burning, or smouldering fire, contained within a deep pit, would thus not have endangered the structure walls. Other possibilities include roasting ovens, pits used in cooking only specific foods, and areas excavated deliberately to smoke meat or prepare hides.

The ceramic assemblage (N=17) recovered from Structure 1 wall posts is Baytown Plain or Baytown period decorated types (Appendix X; also Feature Category Ceramic Summaries). A single Neeley's Ferry Plain sherd was recovered from Feature 267. This was a posthole (Feature 267B) that had been intruded into by a small pit (Feature 267A). This intrusion was not recognized until excavation had been completed and as a result the fill from these two features was mixed. It is believed that the Neeley's Ferry Plain sherd belongs with the later Feature 267A intrusion, and that Feature 267B is a Baytown posthole that is associated with Structure 1.

Other remains that were potentially associated with Structure 1 included cultigens, faunal remains and lithics. The former included maygrass, chenopod and smartweed (Appendix III). Faunal remains and lithic artifacts were less numerous. A variety of animal bones, including mostly large and small mammals and fish were present, but in rather surprisingly small quantities (Appendix II). As to the lithics, only flakes were recovered (Appendix X). In sum, the very limited ceramic evidence would suggest a Baytown date for the structure.

Structure 2

This is one of the more unusual and interesting feature complexes encountered at 3CT50. It consisted of only four postholes which were equally spaced around the edges of a Category 8 burial pit (Figure 34). The burial pit, Feature 654, contained the remains of an 12 year old individual of indeterminate sex (Burial 3), and the associated postholes included Features 672, 673, 674 and 675. The postholes were situated in opposing pairs and were slanted outward, away from the center of the pit. Posts inserted into these holes would have met or crossed about one meter above the pit.

The burial fill (Feature 654) was divisible into an outer and underlying ring of black midden-like soil that enclosed a separate deposit of bright-yellow, sterile clay (see cross-section on Figure 34). Separating these two layers was a very thin lens of carbonized material. The sterile clay deposits (Stratum B) probably had originally capped the entire feature, but we surmise that erosion has exposed the black midden deposit (Stratum A) around the pit edges. The thin lens separating Stratum A and B was discontinuous, comprised of a very delicate, fiberous material that might have once been cloth or matting.

The burial itself was within Stratum B, which also contained numerous artifacts and floral and faunal remains; artifacts included 26 sherds of which 20 (76.9 percent) were typed as Baytown Plain (Appendix X). Ninety-eight lithic flakes and a small biface fragment were also found in Structure 2. Faunal remains were limited, but included small amounts of rabbit, turtle, nonpoisonous snake and bowfin, as well as numerous unidentified mammal and fish bones (Appendix II). Incidental occurrences of maygrass, hickory shell, acorn shell and carbonized wood made up the Structure 2 floral assemblage (Appendix III).

A single radiocarbon date was obtained on the human bone (Burial 3) that was contained in Feature 654. This sample yielded a date of A.D. 1200 $\pm$ 65 (Appendix VI). Analysis of the human bone in Burial 3 produced a C12/C13 ratio which suggested that this individual had consumed large quantities of maize. The affected C12/C13 ratio required that a 200 year correction be applied to the C-14 date, thus yielding a revised date of A.D. 1000.

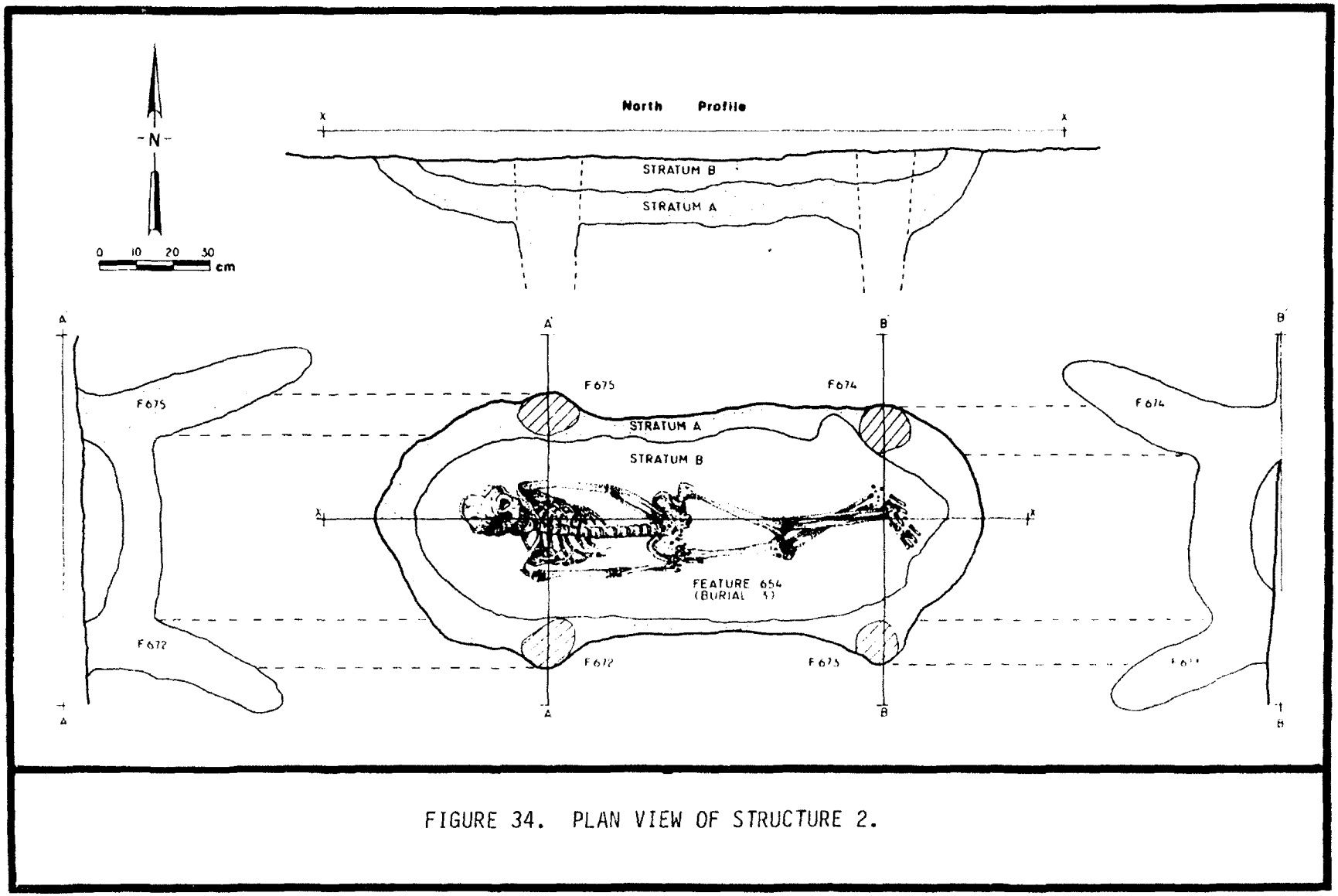
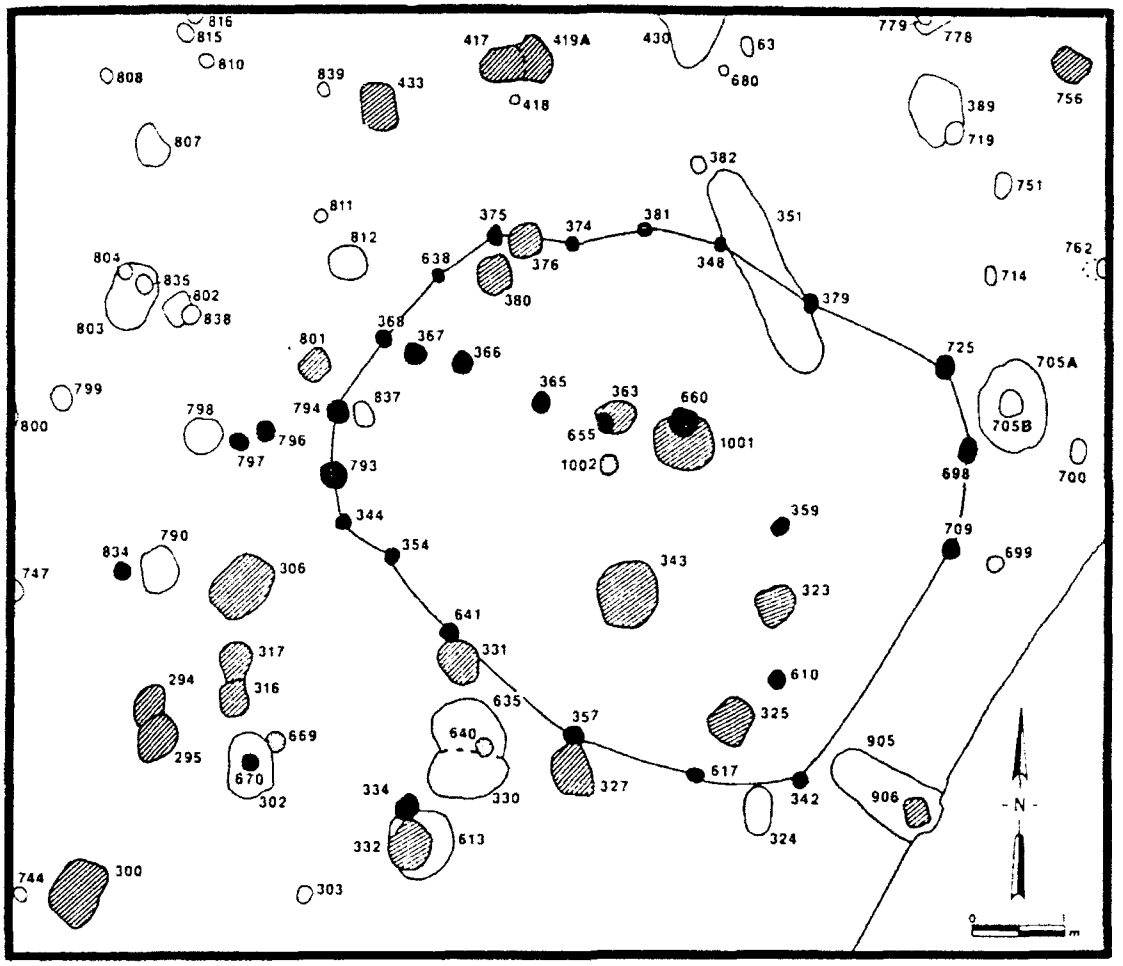


FIGURE 34. PLAN VIEW OF STRUCTURE 2.

Structures 3 and 7

These two structure patterns are discussed under one heading because of intrusive features and postholes. The first, Structure 3, is a slightly oval pattern of postholes that measures 6.35 m by 5.0 m and encloses an area of 31.2 m square (Figure 35). The walls of Structure 3 are comprised of 18 regularly spaced postholes (Table 23); although the pattern of posts was not recognized in the field, its potential as a structural remnant seems good nonetheless.



Wall Post
Possibly Associated
Baked Clay Pit

FIGURE 35. PLAN VIEW OF STRUCTURES 3 AND 7.
Note: the Structure 3 outline is connected.

TABLE 23. STRUCTURES 3 AND 7 FEATURE ASSOCIATIONS.

Feature Function	Feature Category	Feature Number
STRUCTURE 3		
Wall Postholes	1	342
	"	344
	"	348
	"	354
	"	357
	"	368
	"	374
	"	375
	"	379
	"	381
	"	617
	"	638
	"	641
	"	698
	"	709
	"	725
	"	793
	"	794
Features	2	323
	3	343
	"	363
	"	1001
Potentially Associated	1	640
	5/1	660
	1	1002
STRUCTURE 7		
Wall Postholes	1	334
	"	359
	"	365
	"	366
	"	367
	"	610
	"	617
	"	655
	"	660
	"	670
	"	796
	"	797
	"	834
Potentially Associated Postholes	1	368
	"	640
	"	669
	"	794
	"	1002
Potentially Associated Pits	3	306
	"	316
	"	317
	"	331
	"	343
	4	330
		635

Structure 7 measures approximately 6.25 m by 4.3 m, and encloses an area of 26.8 sq m, overlapping partially with the pattern identified as Structure 3 (see Figure 35). The 13 postholes which comprise structure walls form an oval shape that is somewhat irregular, a factor that may be a reflection of Structure 7's association with a cluster of baked clay pits that parallel the line of postholes on the east wall (Features 323, 325 and 1001).

At least three postholes (Features 617, 660 and 794) have been incorporated within both structure patterns because it was impossible to assess which structure they were most likely associated. Evidence, which includes ceramic assemblages and intrusive features, tends to suggest that Structure 3 is the older of the two patterns.

Several postholes in Structure 3 may have been supports for internal partitions, platforms, or the roof. Among these was Feature 660, a large post that extended to a depth of 36 cm. It appears to have been situated in the approximate center of the structure and is a likely candidate for center roof-support post. Feature 660, however, also falls within the line of postholes making up the wall of Structure 7.

A large number of pits are located in the immediate vicinity of Structure 3. Feature 351 is a large trough-shaped pit that contains shell tempered ceramics, and, thus, probably postdates Structure 3. Features 323, 325 and 327 within the Structure 3 outline all appear, however, to be associated with Structure 7. Feature 363 intrudes into a Structure 7 wall posthole and probably postdates both structure patterns.

Feature 1001 is a large, circular baked clay pit that is located in the approximate center of Structure 3. It contained a number of ceramic sherds, including 26 (83.8 percent) Baytown Plain sherds, four (12.9 percent) Baytown Decorated sherds and one (3.2 percent) grit tempered sherd (Table X-3, Appendix III). Other artifacts found in the Feature 1001 fill included wood charcoal, burnt clay lumps and two unidentified biface fragments. Feature 1001 could represent the remains of a central fire hearth. If it is associated with Structure 3, then it represents only one of two baked clay pits that may have functioned as central hearths for structures.

Other pits may be associated with Structure 3 as well; however, it is impossible to validate these associations based upon the evidence at hand. Structure 3 was not recognized in the field because of the congestion of features that concentrated in this area of the site. This same condition also makes it difficult, if not impossible, to formulate relationships between other features and the posthole pattern that comprises Structure 3.

Artifacts associated with the Structure 3 wall postholes include 48 ceramic sherds. Thirty-one sherds (64.5 percent) are Baytown Plain, eight sherds (16.6 percent) are Baytown Decorated, and one

sherd (2.0 percent) is grit tempered (Table X-3). The incidence of decorated sherds and grit tempered ceramics may suggest that Structure 3 dates late within the Baytown period.

Other artifacts associated with Structure 3 include a small amount of lithic debitage (n=26) (Appendix X). Faunal remains recovered from wall postholes included an abundance of fish bone. Feature 617 and 368 produced quantities of squirrel, goose, turtle, frog/toad, catfish, bowfin and unidentified mammal and fish bones (Table II-1, Appendix II). Floral remains were somewhat less prolific, but small quantities of maygrass, sumpweed, chenopod and smartweed were recovered (Tables III-3 and III-6, Appendix III).

As was the case with Structure 3, it is difficult to identify other features that might be associated with the Structure 7 pattern. This is due to the congestion of pits and postholes that were found to be concentrated in this area of Excavation Block 1. A number of baked clay pits are located within the Structure 7 enclosure. These include Features 306, 316, 317, 331 and 343. Features 294, 295, 332 and 748 are baked clay pits that are located immediately outside of the structure walls. Some of these, including Features 306 and 317, contained shell tempered ceramics, and thus may postdate Structure 7.

Lithic artifacts were restricted to flake debitage (n=257), the total of which included the contents of potentially associated features (Table X-9). Ceramic artifacts recovered from these same features numbered 290, of which 247 (85.1 percent) were Baytown Plain, 33 (11.3 percent) were Baytown Decorated, nine (3.1 percent) were grit tempered, and only one (0.3 percent) was classified as Neeley's Ferry Plain (Tables X-3 and X-4).

Faunal remains that were recovered from Structure 7 features were predominately comprised of fish bones. Mammal and bird remains made up only a small portion of this assemblage (Table II-1). Floral remains included squash from Feature 365. Feature 306, which produced a number of grit tempered sherds, also contained small quantities of maize and squash. Carbonized wood and nut shells, sumpweed, maygrass and smartweed were also recovered from features associated with Structure 7 (Tables III-3, III-4 and III-6).

The combined data from Structure 7 suggest that it is slightly later, or younger, than Structure 3. However, we would still suggest that it represents a late Baytown, rather than Mississippian occupation.

Structure 4

This partially excavated pattern of postholes is located in the extreme northeast corner of Excavation Block 1 (Figure 36). Only about half of Structure 4 was revealed as portions of it extended beyond the proposed bridge construction ROW (see Figure 25). Another portion of this structure extended beneath the field road that cuts through the center of the site and had been destroyed.

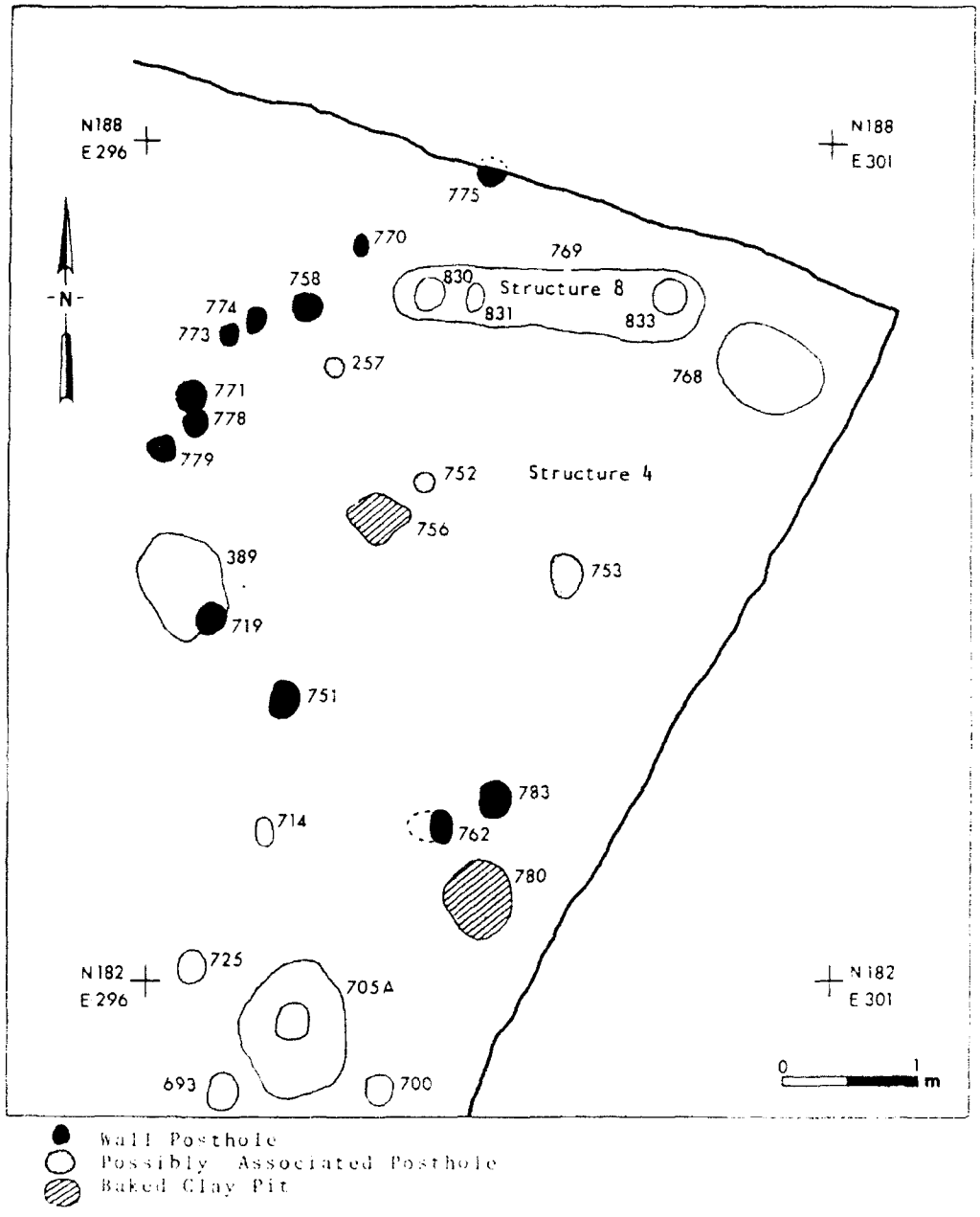


FIGURE 36. PLAN VIEW OF STRUCTURES 4 AND 8.

Twelve wall posts form the western half of what was probably an oval house pattern (Table 24), similar in plan to Structures 1 and 3. Artifacts associated with Structure 4 pattern include 33 ceramic sherds; 26 (78.7 percent) of these are Baytown Plain sherds, while seven (21.2 percent) are Baytown Decorated (Tables X-3 and X-4). Lithics associated with Structure 4 included 47 flakes, almost all of which were small pressure flakes, or shatter made of Lafayette chert (Table X-9).

TABLE 24. STRUCTURE 4 FEATURE ASSOCIATIONS.

Feature Function	Feature Category	Feature Number
Wall Postholes	1	719
	"	751
	"	758
	"	762
	"	770
	"	771
	"	773
	"	774
	"	775
	"	778
	"	779
	"	783
Potentially Associated Postholes	1	752
	"	753
	"	757
Potentially Associated Pits	2	756
	4	768

Floral remains include a small quantity of wood charcoal, hickory nut shells, smartweed, and larger quantities of maygrass. Faunal remains were primarily confined to two postholes; however, small quantities of bone were in the fill of most Structure 4 features (Table II-1). Feature 762 produced quantities of mouse, rabbit, gar, bowfin and indeterminate clam, fish and mammal remains. Feature 774 produced squirrel, white-tailed deer, turtle, catfish, bowfin, drum and unidentified fish and mammal remains.

Other features that may be associated with Structure 4 include postholes 752 and 757. These may have served to hold an interior partition. Feature 756, a squarish baked clay pit, contained 16 Baytown Plain ceramics. Although not located in the precise center of the Structure 4 house pattern, this feature could have served as a central hearth. In addition to ceramics, Feature 756 also contained large quantities of animal bone including squirrel, duck, rabbit, turtle, catfish, gar, bowfin, mouse, snake and various unidentified fish, bird and mammal bones.

Obversely, Features 753, 768 and 769 within the Structure 4 outline all contained shell tempered ceramics, and are probably associated with the partially exposed Mississippian Structure 8 that is located in the same area (see below).

Structure 5

This house pattern consisted of a partially complete, oval pattern of 12 postholes (Table 25; Figure 37), located in the central portion of Excavation Block 2. Like Structure 4 (described above), Structure 5 had been partially destroyed, in this case by the field road that cuts through the center of the site. Only about the eastern two-thirds of the structure was still extant at the time of excavation.

TABLE 25. STRUCTURE 5 FEATURE ASSOCIATIONS.

Feature Function	Feature Category	Feature Number
Wall Postholes	1	62
	"	66
	"	68
	"	107
	"	141
	"	142
	"	167
	"	168
	"	169
	"	178
	"	642
	"	676
Potentially Associated Postholes	1	36
	"	63
	"	103
	"	123
	"	161

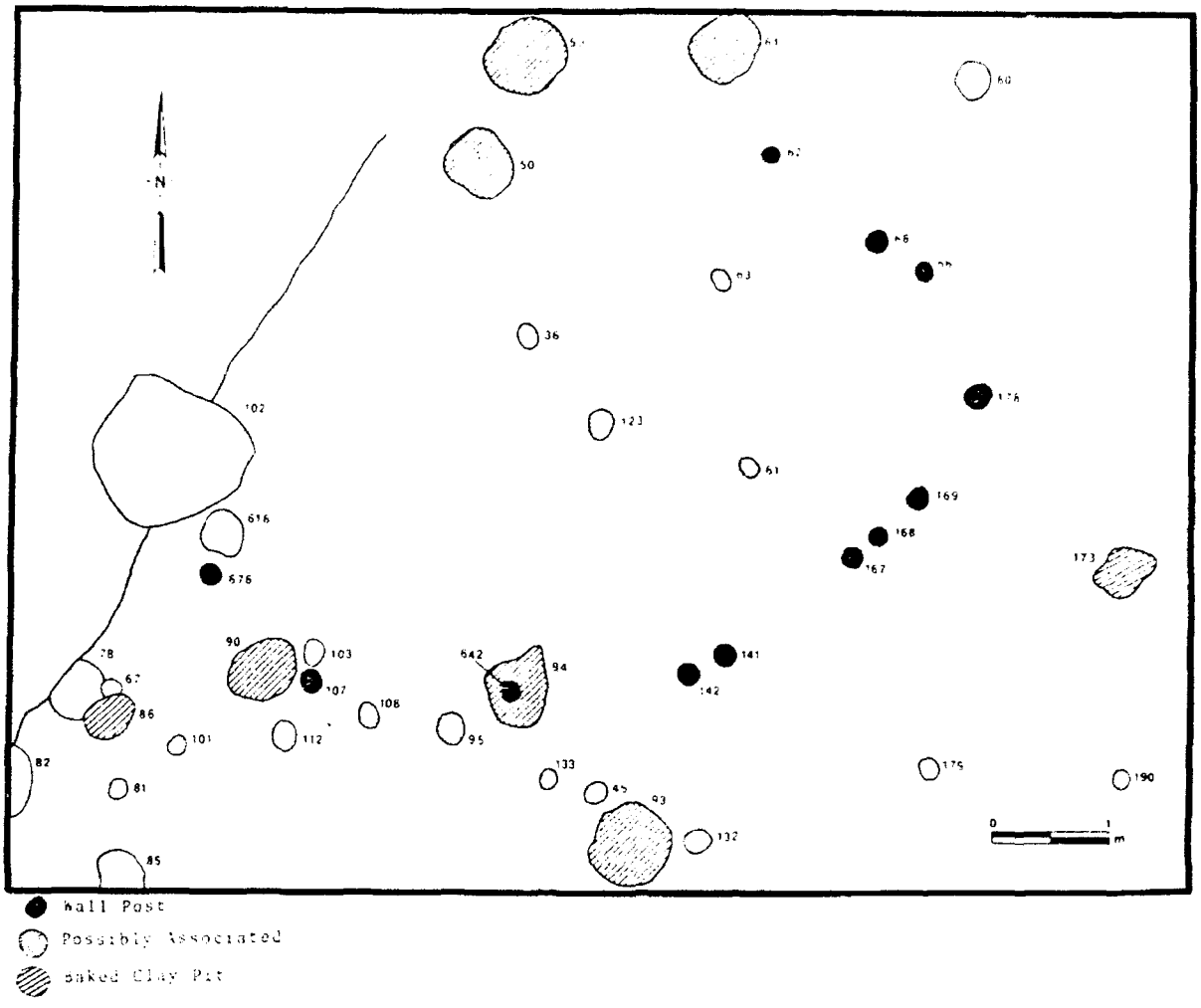


FIGURE 37. PLAN VIEW OF STRUCTURE 5.

Very few artifacts were found in the postholes that comprised the walls of Structure 5. Floral remains were restricted to a small amount of hickory shell and carbonized wood (Tables III-4 and III-10). Lithics included only three small flakes (Table X-9). Faunal remains consisted of small amounts of fish bone and unidentified mammal bones (Table II-1). The seven ceramic sherds recovered from Structure 5 consisted of three (42.8 percent) Baytown Plain and four (57.1 percent) Baytown Decorated sherds (Tables X-3 and X-4).

Structure 6

This structure is located immediately south of Structure 5 in Excavation Block 2. It consist of an irregular oval of 14 postholes which has been partially obliterated by erosion (Table 26; Figure 38). Also associated with Structure 6 is an arc of four baked clay features that comprise Feature Cluster 3.

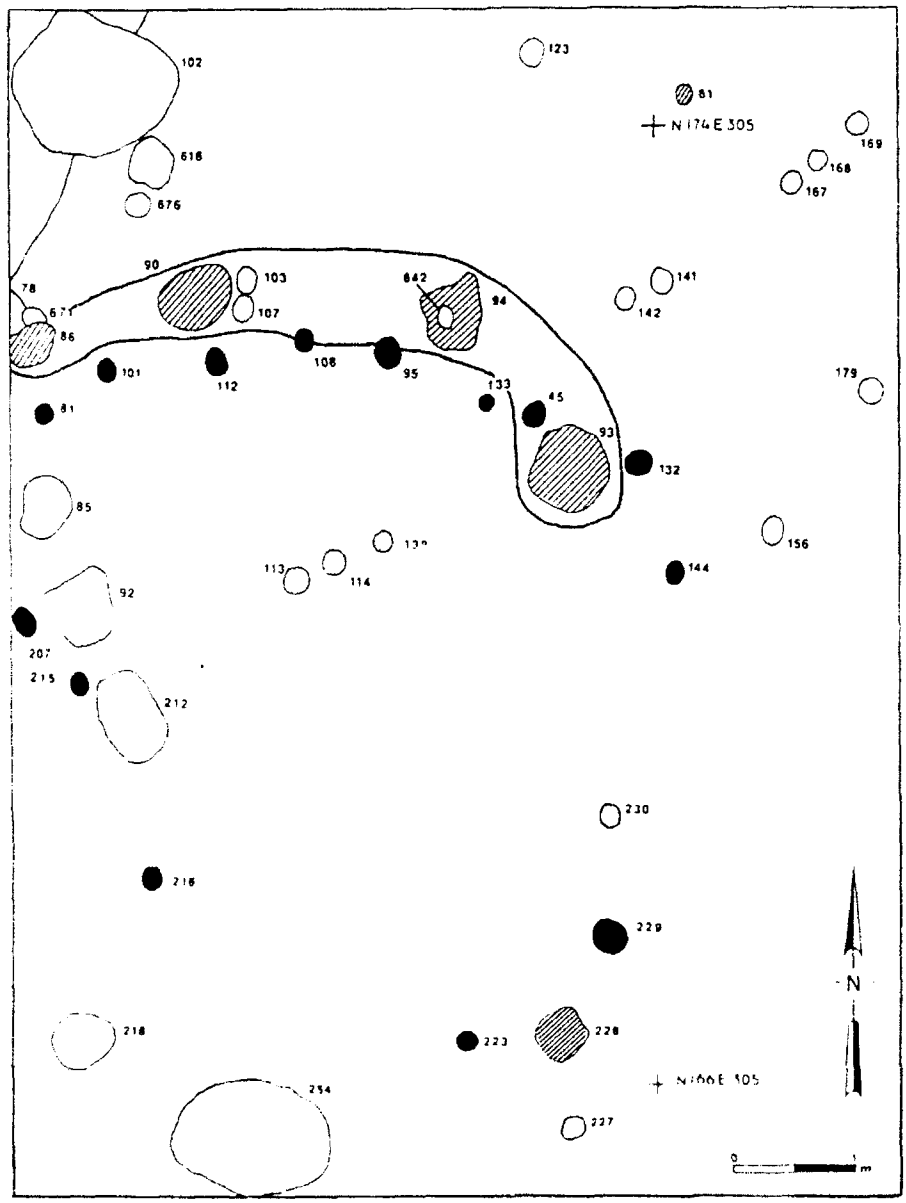


FIGURE 38. PLAN VIEW OF STRUCTURE 6.

TABLE 26. STRUCTURE 6 FEATURE ASSOCIATIONS.

Feature Function	Feature Category	Feature Number
Wall Postholes	1	45
	"	81
	"	95
	"	101
	"	108
	"	112
	"	132
	"	133
	"	144
	"	207
	"	215
	"	216
	"	223
	"	229
Potentially Associated Postholes	1	113
	"	114
	"	138
	"	227
	"	230
	"	255
Potentially Associated Features	3	86
	"	90
	"	93
	"	94
	"	228
	4	85
	"	212
	10	92

Although the northern half of Structure 6 pattern is relatively intact, the southern portion appears to have been almost completely eroded away. Only two postholes were found to be intact in this part of the structure oval, which is located further down the levee slopes from the north wall.

Seven ceramic sherds were recovered from the postholes that make up the Structure 6 walls; three (42.8 percent) of these were Baytown Plain, two (28.5 percent) were Baytown Decorated and two (28.5 percent) were grit tempered sherds (Tables X-3 and X-4). The adjacent

feature cluster (3) yielded 58 (89.2 percent) Baytown Plain sherds and seven (10.7 percent) Baytown Decorated sherds (Tables X-3 and X-4). In addition to ceramics, Feature 90 contained a large quantity (+200) of carbonized hickory nut shells that may have been used to fuel the fires built in this baked clay feature.

Other features that were potentially associated with this house pattern include Features 85, 92, 113, 114, 138, 212 and 228. Features 113, 114 and 138 are postholes that form a short line near the approximate center of the structure enclosure. These may have supported a partition, rake or platform.

Features 85, 92 and 212 are small pits which could have been used for storage. These pits were located just inside of the structure wall and contained nine Baytown Plain ceramics; hickory nut shells, maygrass, and carbonized wood fragments (Tables III-4, III-6 and III-10) were also recovered. Faunal remains from Structure 6 included a variety of fish bones and some mammal bones. Birds and reptiles were also present in small numbers (Table II-1).

The apparent association between Structure 6 and the baked clay features of Feature Cluster 3 suggest that the design of this dwelling may be similar to the design hypothesized for Structure 1. An open sided "chikee" would have allowed smoke from the baked clay pits to filter through without creating excessive amounts of heat.

Structure 8

This is absolutely the most ill-defined of the eight structures at 3CT50. It consists of a single segment of wall trench (Feature 769) located in the extreme northeast corner of Excavation Block 1 (see Figure 36). Within the trench are three postholes, Features 830, 831 and 833, but our structural definition was based primarily upon the presence of shell tempered ceramics in the trench segment and overlying midden.

Features 769 and 833 both contained maize and shell tempered ceramics (Tables III-9 and X-3). Feature 769 also contained a single squash seed. Faunal remains included squirrel, turtle, snake and a variety of fish remains (Appendix II). Lithics were restricted to a single flat abrader from Feature 769 and 19 lithic flakes (Appendix X).

In the midden deposit overlying Feature 769, a number of shell tempered ceramics were found. While not all of this midden appears to be related to a possible Mississippian occupation of the site, portions of it may be related to Structure 8. No other features were found in this part of the excavations that could be directly related to Structure 8 so if this single segment was part of a Mississippian wall trench, it is probable that the remainder is contained in the unexcavated baulk that borders Feature 769 to the north.

Feature Clusters

The 10 feature clusters defined at 3CT50: 1) are comprised of the same (or similar) feature categories (Categories 2, 3 or 4); and 2) exhibit a distribution pattern which is seemingly deliberate. While a few of these clusters were apparent in the field, most were defined after establishing the various categories for individual pits and examining their distribution across the site area.

Feature Cluster 1

Feature Cluster 1 is a straight, linear arrangement of three Category 2 baked clay pits (Features 173, 174, and 189B) (Figure 39).

The center points of Features 174 and 189B are separated by 1.40 m and Feature 173 is 1.32 m distant from Feature 174. The total length of Feature Cluster 1 measures 2.72 m with a long axis generally northeast and southwest. All three features exhibited extensive evidence of firing, or burning of the surrounding soil matrix; however, the contents were noticeably sparse.

Feature 174 produced only a few fragments of unidentified carbonized hardwood and a small amount of unidentified mammal bone (Tables II-1, III-10). Feature 173 also produced a single biface fragment (see Biface Category 8c, Appendix X). No other materials, however, were recovered from these features. The absence of diagnostic artifacts within all three features makes it impossible to date them, except that Category 2 feature are typically Baytown.

Feature Cluster 2

Like that described above, Feature Cluster 2 consists of a linear arrangement of three Category 2 baked clay features; these are arranged in a shallow arc, however. It, also, is located in Excavation Block 2 and is situated so that it is almost exactly perpendicular to the long axis of Feature Cluster 1 (Figure 39).

Feature Cluster 2, comprised of Features 28, 56 and 305B, is slightly shorter in length than Feature Cluster 1, measuring only 2.21 m. The center points of Features 305B and 56 are separated by 1.01 m, while Features 56 and 28 are separated by 1.2 m.

Features 28 and 56 contained considerable quantities of floral and faunal remains. Included in the floral assemblage from Feature 56 was a single fragment of carbonized squash rind (Table III-9). Feature 28 contained maygrass and chenopodium, as well as hickory nuts, walnuts, acorns and various carbonized wood fragments (Tables III-3, III-4 and III-10). Faunal remains recovered from Features 28 and 56 included various terrestrial fauna and aquatic animal remains (Appendix II). Interestingly, the content of Feature 305B was stark in comparison. The upper portion of this feature, however, had been previously

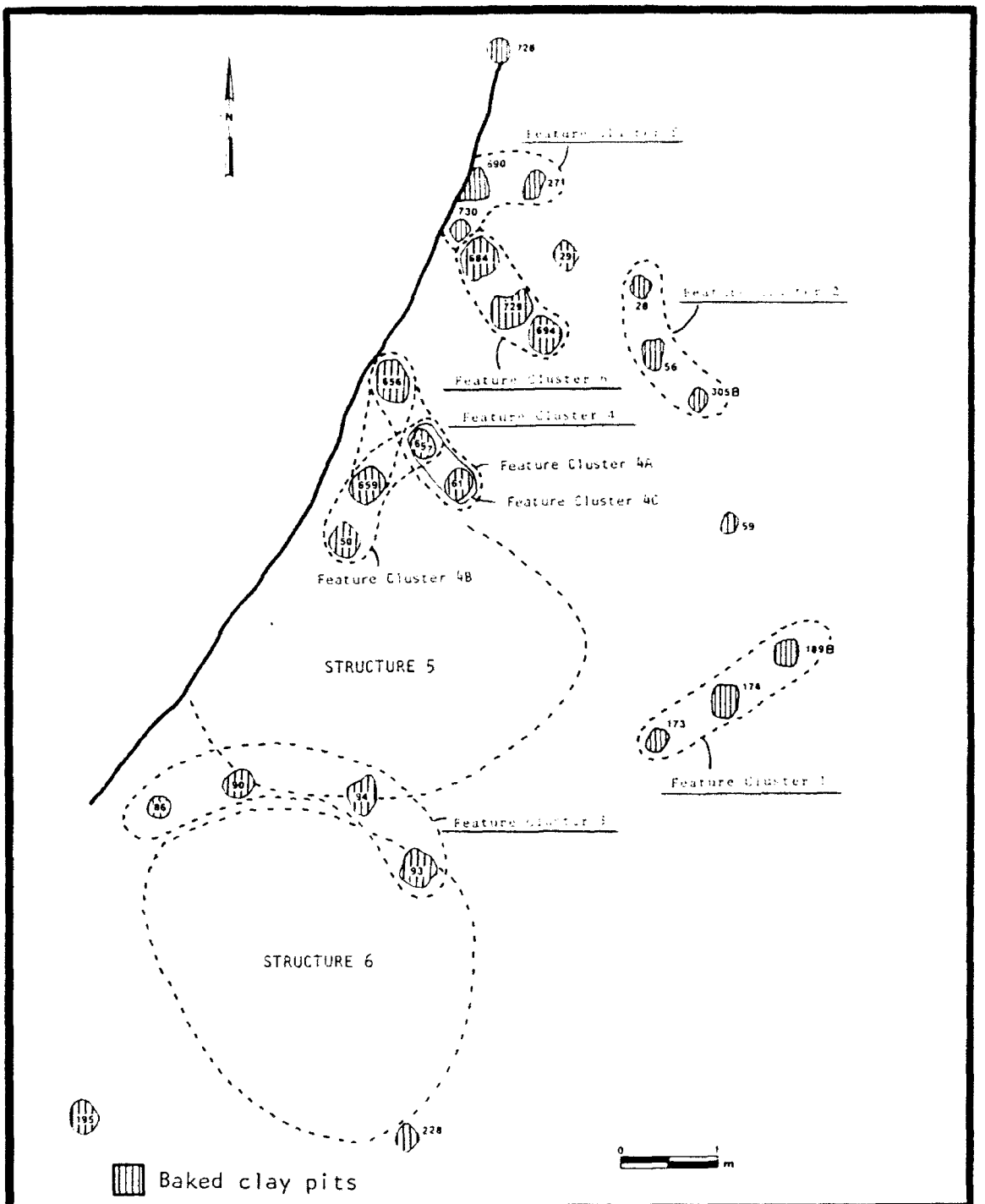


FIGURE 39. DISTRIBUTION OF FEATURE CLUSTERS 1, 2, 3, 4, 5 AND 6.

removed by the excavation of Feature 305A. It is likely that much of the original content of Feature 305B was removed by this later intrusion.

Ceramics recovered from Feature Cluster 2 included only three Baytown sherds from Feature 56; lithics were absent. A carbon-14 sample obtained from Feature 28 yielded a date of A.D. 646, which is in agreement with the ceramic sherds from Feature 56 (Appendix VI).

Feature Cluster 3

This feature cluster consists of four equally spaced Category 3 baked clay pits. These four pits describe a wide, shallow arc that both parallels and is partially included within the line of postholes that define the north wall of Structure 6 (see Figure 39). The spatial alignment and close juxtaposition between Feature Cluster 3 and Structure 6 does not appear to have been random, but more probably indicates a functional relationship. As discussed below, this apparent association may shed some light on both the original appearance of Structure 6 and the function of the 3CT50 feature clusters, as well as the baked clay features of which they are comprised.

Feature Cluster 3 consists of Features 86, 90, 93 and 94. Spacing between the center points of the adjacent features within this cluster range from 1.35 m to 2.1 m. The total length of Cluster 3 is 4.98 m, making it the longest of the linear feature clusters defined at 3CT50.

The floral content of the features in Cluster 3 is variable, however, all four features contained maygrass (Appendix III). Smartweed was recovered from Features 90 and 93, and, in addition, Feature 90 contained quantities of hickory nut shell, pecan, and acorn, as well as carbonized wood remains. Faunal materials were found in Features 86, 93 and 94. These included the remains of aquatic fauna, amphibians and both small and large terrestrial mammals.

Lithic artifacts recovered from Cluster 3 features included a number of debitage flakes. Feature 90 also contained a Category 5 bifacial drill fragment manufactured on Boone chert (Appendix X). All four features contained Baytown period ceramics.

The relationship between Cluster 3 and Structure 6 is hypothesized to have been functional. One interpretation of the baked clay features found at this site is that they functioned, at least in part, as smudge pits and, as noted earlier, served to allow warm weather occupation of an open-sided dwelling (Structure 6) similar in construction to the Seminole chikee. Given this form of construction for these dwellings it is likely that the smouldering fires of smudge pits would have posed no major threat in the form of accidental fires.

Feature Cluster 4

This feature cluster is somewhat problematic in that there are several alternative ways in which it can be described. As Figure 39 illustrates, within this cluster of five baked clay pits three overlapping arcs of features could be defined. These potential groupings of features are listed as Feature Clusters 4A, 4B, and 4C.

Feature Cluster 4A includes Features 50, 656 and 659. These features are not as equally spaced as some of the other feature clusters that have been described above. The center points of Feature 50 and Feature 659 are separated by one meter while the centers of Features 656 and 659 are separated by 1.8 m. The total length of Feature Cluster 4A is 2.74 m.

Feature Cluster 4B includes Features 61, 656 and 657. This shallow arc of three features is slightly shorter than Feature Cluster 4A, extending approximately 2.63 m. Spacing between the center points of Features 656 and 657, and 657 and 61 is very regular, with both sets being approximately one meter apart.

Feature Cluster 4C also describes a shallow arc of three features that are likewise, regularly spaced. Feature 50 and Feature 659 possess center points that are separated by one meter. The center points of Features 659 and 657 are spaced 1.15 m apart. The total length of this feature cluster is 2.65 m.

Although the baked clay features included in Feature Cluster 4A were observed to be markedly similar in appearance, particularly with regard to their cross-section morphology and internal stratigraphy, the unequal spacing between these features cast some doubt upon their inclusion within a single feature cluster. This may be due to the intrusion of Burial 1 (Feature 658) into Features 659 and 656, as well as into nearby Feature 657 (Feature Clusters 4B and 4C). Burial 1 carries a Carbon-14 date of A.D. 920 $\pm$ 65 which indicates that these features were constructed and utilized at some earlier date. Ceramic artifacts recovered from Burial 1 and Features 656, 657 and 659 seem to bear this out as the former contained grit tempered sherds, while the latter group of features contained only earlier Baytown grog tempered ceramics.

Feature Clusters 4B and 4C are more regular in overall appearance, but this factor alone does not render these clusters especially more valid than Feature Cluster 4A. Neither did the content of individual features within the three potential clusters shed any light upon their respective validity. Faunal and floral remains were abundant in the fill of all five features. Ceramics consisted primarily of Baytown plain sherds, and although lithic artifacts were present in the form of debitage and bipolar cores, none of these materials were diagnostic.

Feature Cluster 5

The position of this cluster of features relative to the site access road and accompanying ditch makes it difficult to assess its validity (see Figure 39). Furthermore, a considerable amount of disturbance was evident in this part of the site due to both modern tillage, as well as prehistoric digging. As a result, Feature Cluster 5 is only tenuously defined.

Feature Cluster 5 consists of three Category 2 baked clay pits (Features 27, 690 and 730). The arrangement of these features is such that they form a somewhat irregular and abrupt arc that is located in the northwest corner of Excavation Block 2 (see Figure 39). It may actually have been that another feature was associated with this cluster, but that this member was obliterated by the construction of the adjacent road. Some evidence of this was present in the form of large chunks of burnt clay from the fill in the drainage ditch located immediately west of Feature 690. If such a feature did exist then it is likely that Feature 730 does not belong with this cluster. It has, however, been included here because of its close proximity and similarity to the other two features that make up this cluster.

Artifacts and preserved organic remains were relatively sparse in this cluster. In part this seems to have been related to the heavy amount of disturbance that was evident in this area of the site. It may also have been simply inherent in these features as a product of their final periods of usage. Such features may have been periodically "cleaned out" as they became filled with accumulated refuse.

All three features in this cluster contained Baytown ceramic sherds. Also present was a single projectile point (Appendix X, Biface Category 1) manufactured on an unidentified chert variety. The projectile point is spike-like, probably Middle Woodland and fits well within the time frame that is suggested by the ceramics. Feature 27 is the only one of the three pits that contained any floral or faunal material. Included in this pit were a number of fish vertebra and fish scales, as well as a small quantity of carbonized maygrass.

Feature Cluster 6

This cluster is comprised of three Category 3 baked clay features. These include Features 68A, 694 and 729 which are arranged in a shallow arc that is oriented so that it precisely parallels Feature Cluster 4B located to the immediate south (see Figure 39).

Feature Cluster 3 spans a distance of 2.4 m, which is only slightly shorter than Feature Cluster 4B. The distances between the center points of adjacent Features 694 and 729, and 729 and 684A were 85 cm and one meter, respectively.

Features 729 and 684A contained large amounts of floral and faunal remains. Included in the floral assemblage from Feature 729 were the remains of sunflower and maygrass. Maygrass was also recovered from

Feature 684A and various nut fruits and carbonized wood fragments were also present. Faunal remains from these two features included a variety of terrestrial, aquatic and amphibious species. Feature 694 contained no such materials, however, this can probably be attributed to later intrusions and disturbances which had removed much of the upper portions of this pit.

All three features in Cluster 6 contained Baytown ceramics. Feature 729, however, also contained a quantity of grit tempered sherds which may suggest that it, or perhaps it and the rest of Cluster 6 date late in the Baytown occupation of the site. With the exception of a single flake which was recovered from Feature 684A, lithic artifacts were conspicuously absent.

Feature Cluster 7

This cluster is comprised of Features 323, 325 and 327. These Category 2 baked clay pits are situated so that they form a short shallow arc. Similar to Feature Cluster 3, Feature Cluster 7 is aligned along a series of postholes that comprise the east wall of Structure 7, located in Excavation Block 1 (Figure 40).

The arc formed by Feature Cluster 7 measures approximately 3.1 m in length. The center points of Features 323 and 325 are separated by approximately 1.4 m, while the center points of Features 325 and 327 are separated by 1.7 m.

The content of the features contained in Feature Cluster 7 is rather typical of other baked clay features of the same type category. Features 323 and 327 contain a variety of aquatic and terrestrial faunal remains. Although Feature 325 did not contain faunal remains, both sumpweed and maygrass were present in the fill of this pit. Additionally, Feature 327 contained carbonized sunflower. Other artifacts obtained from Cluster 3 include Baytown ceramics and a small number of lithic flakes.

The alignment of Cluster 3 with Structure 7 tends to support the hypothesis offered above that a functional relationship existed between some of the structures defined at 3CT50 and these linear clusters of baked clay pits. That two such occurrences were identified in those areas of the site that were investigated decreases the explanation that these were random occurrences. A similar structural design for Structure 7 may therefore be offered as was proposed for Structure 6.

Feature Cluster 8

This small cluster of four baked clay pits represents a distinctive departure from the pattern of clusters described above. Features 294, 295, 316 and 317, which comprise Cluster 8, are "bunched" together into a small, compact group (Figure 40). These small pits occur together in two separate sets with Features 294 and 295

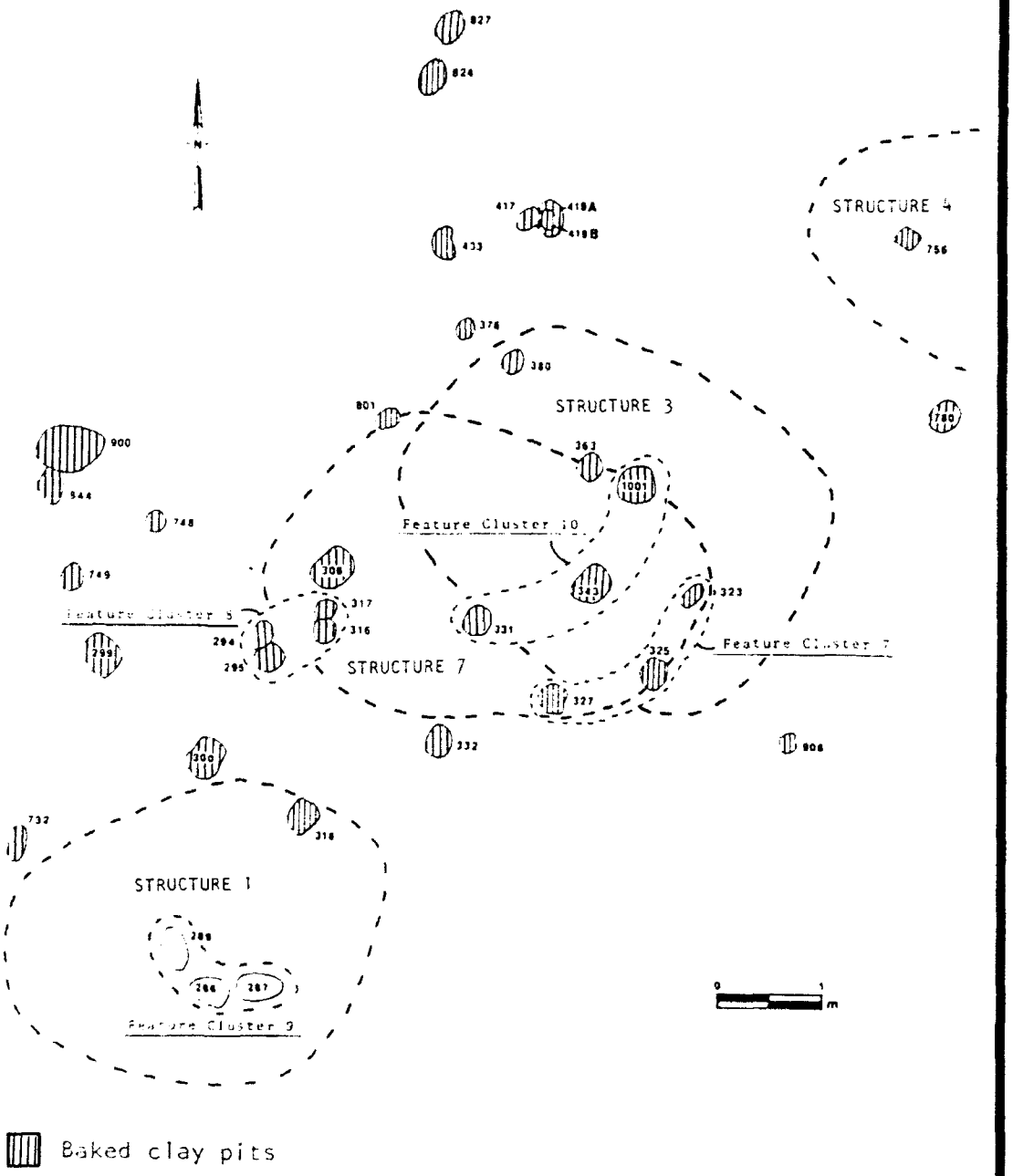


FIGURE 40. DISTRIBUTION OF FEATURES CLUSTERS 7, 8, 9 AND 10.

overlapping each other, and Features 316 and 317 also overlapping. Less than 0.5 m separates these two overlapping sets of baked clay pits.

Although all four of the pits that are included in Cluster 8 have been classified as Category 3 baked clay pits, the distinction between these features and Category 2 features was not entirely distinct. To some extent the outline of all four features is more rectangular than round, thus these features share at least some affinity with Category 2. While the distinction between Category 2 and Category 3 features may be insignificant, some evidence, particularly in the form of ceramic assemblages, suggests that the latter pit type is later. For our purposes here, however, it is more important to recognize that the features that are included in Cluster 8 are of the same morphological and, presumably, functional type.

Overall, the content of the features within Cluster 8 is fairly uniform. Floral remains include quantities of carbonized wood from Features 295, 316 and 317. Feature 294 contained a single maize kernel as well as small quantities of sumpweed. Maygrass and sunflower were recovered from Feature 295 and a small quantity of maygrass was also noted in Feature 317. Of particular interest was the presence of over 200 hickory nut shells and 100 acorn shells in the fill of Feature 295. These undoubtedly constituted a form of fuel for the burning process that is evident in the intensively fired clay rim that surrounds this feature.

Faunal remains were recovered from Features 294, 295 and 316. Feature 295 produced quantities of small and large mammals, amphibians, bird and fish. Features 294 and 316 contained the remains of both aquatic and amphibious species.

Artifacts recovered from Cluster 8 included both lithics and ceramics. In addition to a small amount of lithic debitage, Feature 295 produced two broken fragments of sandstone abraders (Appendix X: Groundstone Tool Categories 5 and 6). A large number of Baytown ceramics were recovered from Features 295 and 317 (n=52 and n=44, respectively) while substantially fewer Baytown sherds were found in Features 294 and 316 (n=6 in both features). This discrepancy could argue against the supposition that Features 295 and 316 were constructed merely to enlarge Features 294 and 316 since if both features within each set were being used at the same it would be expected that cultural remains would have been more evenly distributed.

Cluster 8 does not appear to have been associated with any structures. The arrangement of these features may suggest a different function from those that are dispersed in a linear fashion.

Feature Cluster 9

The three features that comprise this cluster were previously mentioned in the discussion of Structure 1. Feature Cluster 9 is interesting because it is the only feature cluster that is comprised

of feature types other than Feature Categories 2 and 3. It consists of Features 286, 287 and 289, all three of which were classified as Category 4 shallow basin-shaped pits.

The features in Cluster 9 are arranged so that they encompass a short, abrupt arc that is approximately 2.3 m in length (see Figure 40). The center points of adjacent Features 286 and 289 are separated by 85 cm, while Features 286 and 287 are separated by 80 cm.

In both appearance and content, the three basin-shaped pits that comprise Cluster 9 are markedly similar. The fill from these features produced a surprisingly scant amount of material remains. The carbonized walnut shell and oak recovered from Feature 289 constituted the only floral remains. Faunal remains were completely absent from the fill of all three features. Feature 286 contained small numbers of Baytown sherds and lithic debitage.

The spatial disposition of Feature Cluster 9 in relation to the Structure 1 posthole pattern strongly suggests that the two are related. The absence of burning in any of the Cluster 9 pits, and their location within the interior of Structure 1 clearly indicates a function different than that ascribed to other feature clusters. A logical assumption is that these features functioned as storage pits, however their content does not bear this out. It is possible that they were somehow related to the support and construction of Structure 1, though the precise nature is unclear.

Feature Cluster 10

This cluster contains three baked clay pits, and possibly a fourth feature, that are aligned in a wide arc. Included in this cluster are Category 3 Features 331, 343 and 1001. Another Category 3 baked clay pit, Feature 306, may also belong in this cluster but it is spaced somewhat further away from the other three pits (see Figure 40).

Adjacent features within Cluster 10 are evenly spaced and span a total distance of 4.2 m. The center points of Features 1001 and 343 are separated by 1.6 m while the center points of Features 343 and 331 are 1.75 m apart. Feature 306, which is not directly included in this cluster, is separated from the center point of Feature 331 by 2.3 m.

Baytown plain and decorated ceramic sherds were recovered from all three Cluster 10 features. Feature 306 also contained a fairly large quantity of these sherd types, in addition to four grit tempered sherds. Feature 1001, which contained 26 Baytown plain sherds and four Baytown decorated sherds, also contained a single grit tempered ceramic sherd. Lithics recovered from these features consisted of a small amount of flake debitage. Feature 1001 also contained two biface fragments (Appendix X: Biface Category 6c) and a polished pebble (Appendix X: Non-chipped Stone Tool Category 4) which may have been used in pottery manufacturing.

Floral remains included small quantities of maygrass, sumpweed, maize, squash and hickory nut shells from Feature 306. Feature 331 also produced quantities of maygrass and hickory nut shell, in addition to a large quantity of carbonized wood (Features 1001 and 343). Faunal remains included species of small mammals, amphibians, birds and fish from Features 331 and 306.

ASSESSMENT OF PHASES I AND II INVESTIGATION

Through the combined results of Phases I and II, an appreciable body of data was obtained on the prehistoric utilization of 3CT50. The high points of information gathered by investigation can be summarized briefly as:

1) 305 cultural features that included 193 postholes, baked clay pits, various categories of unfired pits, four burials (one was a pregnant woman), and a probable wall trench segment;

2) 26 pockets of midden, situated among the concentration of features, and treated in a similar manner until excavation and/or analysis distinguished them as midden remnants;

3) a buried A horizon (Stratum II) that was associated with still extant prehistoric midden on the upper slopes of the relict Mississippi levee and in Excavation Block 1 near the levee crest--both the A horizon and midden were believed to have been once more extensive over the site, but impacted since prehistoric times by repeated plowing, erosion and other natural disturbances;

4) a deeply buried A horizon (Stratum IV), unassociated with cultural midden deposits in that portion of the site investigated by NWR;

5) intra-site variation in the texture and sequence of soil deposits that divided the property into three areas--Little Cypress Bayou/Big Creek deposits--Big Creek channel fill deposits--natural levee deposits;

6) intra-site variation in the density of materials;

7) primary occupation during the Baytown period, with a veneer of Mississippian suggested by radiocarbon dates and minor ceramic frequencies;

8) a wide variety of exploited faunal and floral resources, the latter including cultigens and limited evidence of domesticated plants (e.g., maize, squash, bean); and

9) feature patterning that suggests eight structures and ten clusters of pits.

In assessing the value of NWR's investigation of the Little Cypress Bayou site, we have to approach the subject from three perspectives. First, there is a consideration of whether adverse impact has been mitigated; our response is affirmative on this point. Although the initial tasks of Phase I investigated the entire site area, the thrust of both field phases was upon intensive data recovery within the ROW.

As with most data recovery programs, examination of 100 percent of the ROW was impractical and unwarranted in order to achieve a satisfactory mitigation of impact. However, by sampling deposits at the site during Phase II, recovered data were representative of the intrasite variability observed through Phase I results. Then, expanded block excavation and removal of feature deposits exposed by mechanical stripping could be concentrated on the upper relict levee slopes where prehistoric occupation had been the most intense.

Assessing the investigations from a second perspective, the volume and nature of data collected provide a good basis for interpreting the occupation; however, although the information could also be construed as well suited to examining 3CT50 in light of research issues that were raised in Chapter Three, our initial focus will be upon trying to answer some basic questions about the site itself. Toward this end, the broadly based and largely theoretical themes of our research design need to be set in reserve for the time being.

This brings us to the third perspective, which is whether any aspect of the project has distinguished it in the record of archaeological research of northeast Arkansas. By this question, we are expressing an opinion held by much of the archaeological community that the design of CRM research programs should be rooted in a comparative data base provided by previous research and then carried out with an intention to build upon that base for future studies. It is this premise, the need for more site-specific data, on which the first part of Chapter Five has been developed. The extent to which these investigations might help refine or revise issues more germane to Central Valley research as a whole can be judged by a revised research design that comprises the second part of Chapter Five.

CHAPTER FIVE

CONCLUSIONS

The presentation of findings in Chapter Four was purposefully intended as a synthesis of the multiplicity of facts and information about the prehistoric occupation at 3CT50. The full text of consultants' reports and in-house analyses are contained in the appendices, presented as a companion volume to this report. Together, Chapter Four and the appendices are designed to be a functional, comprehensive reference containing the corpus of data derived from the project as a whole.

In this final chapter of the technical volume, we are narrowing the focus in order to express what has actually been learned about the site. While part of the focus relates the corpus of data to current issues and themes presented in the research design, the thrust of these concluding discussions departs substantially from our original orientation as presented in Chapter Three.

Orientation

The shift in orientation was not unexpected since the research design had been formulated on the basis of survey level data and available information on areal environment and prehistory. By design, the orientation focused on unanswered questions and conceptions of patterned behavior during several cultural periods represented by artifacts previously collected at the site. There was and is nothing inherently wrong in the focus of NWR's research design, especially since the themes were related to 3CT50 through a consideration of similar sites (e.g., Brougham Lake); the chapter has been left as written to underscore that point.

However, our perspective is different now. What was perceived through the anonymity of inanimate objects and variation in stratigraphy, suggested by previous work, has become a place called Little Cypress Bayou where people lived, and a few died, hundreds of years ago. For some part of the year, this small community shared many traits with people elsewhere and throughout time; they worked, ate, slept, had babies, lost teeth and got sick. They were real people, living in a functional environment, and, to use a hackneyed phrase, we have been able to look through a window in time at a slice of life that should not be inconsequentially pigeon-holed by preconceived notions.

In making this statement, we are specifically referring to archaeological concepts about time and culture that have been perpetuated under the rubrics of Baytown and early Mississippian, concepts supported by a regional data base which is still only in a nascent stage (cf. Klinger et al. 1983, Morse and Morse 1983, Davis 1982). In the absence of sufficient data from investigations concentrated on sites like Little Cypress Bayou and Brougham Lake (Klinger et al. 1983), among others (cf. Morse and Morse 1983; Klinger et al. 1983), the literature on these periods (and various phases) abounds with generalities and broadly based research topics. While data are available which could address some of these issues, theoretical differences on the part of researchers have, in some cases, emphasized certain aspects of the occupation(s) over others that are equally important to giving definition to the concepts of Baytown and early Mississippian.

The lack of comparability in the data is also a problem because generally accepted techniques for current data recovery projects were not all employed (a few were not available) for the investigation of sites even a decade ago. Some examples are the systematic recovery of samples for flotation; increased use of chemical flotation; inclusion of multi-disciplinary analyses; availability of absolute dating techniques, such as C-14 and archaeomagnetic sampling; and the application of specialized analyses, like stable carbon isotope, phytolithic, spectrographic, trace element and thin section preparation.

Comparability of site data, therefore, is a factor in evaluating research concerns from the existing information base, but a critical overview tempered by recognition of the problem can succeed in extracting a substantial amount of useful information. The Rose et al. review of burial data from the Mississippi Valley is an excellent example (see Appendix IV). Further, as more comparable techniques are employed with greater regularity and consistency on the sites in the area, the corpus of data on Baytown and early Mississippian sites in this part of Arkansas will expand to the point where broader based culture issues can not only be addressed, but perhaps even resolved.

The Data Base in Perspective

At present, however, there are two needs that must be satisfied to ensure as much consistency as possible in the data base, as well as to

maximize information from site investigation, particularly at the intensive testing and mitigation stage. One focuses on establishing parameters concerning the temporal, cultural and functional implications of Baytown and early Mississippian. Second, and critical to the first point, is the subdivision of the super-type Baytown Plain into manageable, and hopefully, meaningful units. These needs are crucial, for the reasons cited below.

First, the distinction of Baytown as a period has not yet led to sufficient clarification of Baytown as a culture. In their overview of regional archaeology, Morse and Morse (1983:181) introduce the Woodland discussion by commenting that the "Baytown period is the Central Valley's classificatory niche for Late Woodland." They go on to remark that it has "...been little investigated primarily because of a general lack of exotic artifacts and earthworks." Morse and Morse (1983) are certainly more versed in the data on northeast Arkansas prehistory than we; yet, even with a broad base of regional expertise, they find themselves limited in the extent to which they can offer detail on Baytown occupations.

In the Arkansas Study Plan (Davis 1982), Baytown (Study Unit 9) is referenced as a focus of numerous general and specific research questions. For example, under the general topic 'technology,' there are several questions on the relationship of household size to vessel or storage pit size. And, in the summary paragraph about Baytown, the study plan remarks on the potential for several phases to be eventually defined; Morse and Morse (1983) infer a similar need in their overview of Central Valley prehistory. Prevailing throughout the literature is an inference that, overall, Baytown seems to be easily envisioned as a span of time, but there are little data to characterize what it means in terms of places in time.

Second, as alluded to above, there are little substantive data on settlement, either at the cultural, village or household level. Again, Morse and Morse (1983:181) generally characterize Baytown sites as "relatively small" and basic settlement patterns as being "dispersed small villages...similar to that evident during the Marksville period." Some factual observations are offered on Dunklin phase households and comparisons made to other phases of Baytown, but when Morse and Morse (1983:183) begin to discuss the Baytown phase in particular, they note that differentiating "between Baytown and non-Baytown Woodland sites is difficult."

Third is the issue of chronology itself. While Baytown has been loosely defined as a 300 or 400 year period from A.D. 400 to A.D. 700 or A.D. 800, chronometric samples are small and the relative frequencies of certain ceramic types are more often used for distinguishing cultures in conflict than cultures in time. Morse and Morse 1983:182) cite the Hyneman 1 and 2 sites where a radiocarbon date of A.D. 1050 was obtained for the former and two dates of A.D. 642 and A.D. 761 for the latter. Hyneman 1 was considered Mississippian, while Hyneman 2 was placed in Baytown. No sigma was given for the

Hyneman 1 date, but sigmas of ± 138 and ± 151, respectively, were provided for the Baytown samples from Hyneman 2. This means these two dates could actually be as late as A.D. 780 and A.D. 912.

Klinger et al. (1983:488) cited two dates from 3PO54 as A.D. 620 ± 130 and A.D. 740 ± 136; at the higher date range, these could be pushed beyond the A.D. 700 and A.D. 800 cut-off mark for Baytown. Klinger's own C-14 date from Feature 83 at Brougham Lake was A.D. 780 ± 80, again beyond what is assumed to be the end of the Baytown period.

Of course, we are not ignoring how these dates would all fall if the sigmas were subtracted instead of added. Certainly, they would all be well within the accepted range for Baytown chronology and some might even be earlier than expected. The issue remains, however, that with imprecise chronological definition, clarification of the cultural concepts of Baytown and early Mississippian will remaining wanting.

Yet, none of these issues will be approachable unless the second need is fulfilled. This principal stumbling block is our perception and use of the ceramic type, Baytown Plain. The ambiguity of Baytown Plain, the most prevalent type identified in Late Woodland collections of the region, is an implication that is pervasive in the archaeological literature.

As defined by the Mississippi River Valley surveys (Phillips et al. 1951; Phillips 1970), Baytown Plain is a super-type that occurs in variant forms from Marksville (e.g., Baytown Plain, var. Thomas) through early Mississippian (Baytown Plain, var. Addis). It is differentiated by paste and temper, surface treatment, firing, rim form and vessel shape. Yet deciding whether the occurrence of a particular variety in a collection represents a separate component, cultural or temporal overlap, intrusion, culture lag or regional variation is often a matter of relative frequencies.

While region wide, and into the Lower Valley, the interpretational problems associated with Baytown Plain abound, the problems seems particularly prevalent in the Central Valley and the area around 3CT50 in particular. At both Little Cypress Bayou and Brougham Lake, the ceramic collections, dominated by Baytown Plain, could be characterized as:

1) dominated by body sherds,

2) marked by an absence or low occurrence of rims; and

3) marked by a very low incidence of decorated sherds, which in turn were dominated by only one or two types that were, in themselves, unreliable discriminators of variation during a single period.

These characteristics prevail at Baytown sites in northeast Arkansas and collections from habitation sites like 3CT50, as well as transient or special activity sites. And, it is the nature of these

collections that has retarded interpretation of the Late Woodland period. This condition will continue until some region specific distinctions are defined; then they can be tested by comparable work and refined.

The super-type created by Phillips (1970) and others was only an umbrella term that, elsewhere, has been divided into recognizable varieties with at least some degree of success. The subdivision has not yet been successful, however, in the project region and the Arkansas Study Plan (Davis 1982), as well as Morse and Morse (1983), have pointed this failure out, and have emphasized through research suggestions, methods of resolution.

In retrospect, if we could begin this project again, we would devise an analytical work plan that took advantage of the best and most advanced techniques for mirco-examination of ceramics, large sample cross-dating by several types of analysis, and other procedures that would be designed to yield the information necessary to make finer distinctions in the type Baytown Plain, var. Unspecified. This hindsight notwithstanding, we have been able to review the occupations at 3CT50 which material diagnostics and chronometric studies have dated to between A.D. 575 and A.D. 1200.

The associations of relative and absolute samples were loosely defined by the rubrics Baytown or early Mississippian without any consideration to temporal or cultural distinctions, except within that 600-odd year span. Data on the cultural deposits were then examined on what is best described as a synchronic plane in order to see the relationship between what is called Baytown and what is called Mississippian. This approach has at least enabled us to offer a suggestion as to what is implied by both cultural constructs. These are the results of the interpretive analysis and the conclusions we have drawn.

THE EVIDENCE FOR OCCUPATION AT LITTLE CYPRESS BAYOU

Relative and Absolute Sample Associations

The chronometric studies on samples recovered from baked clay features and burials provide a group range from the late seventh century to after A.D. 1200. Dates between A.D. 500 and A.D. 800 cluster in the time period acceptable for the chronological placement of Baytown. Two of the Baytown dates are provided by radiocarbon dates (Appendix VI) obtained on Category 2 baked clay pits (Features 28 and 376). Charcoal samples from the features produced seventh century dates of A.D. 635 (Feature 376) and A.D. 646 (Feature 28). In addition, seven features were the subject of archaeomagnetic analysis. Using the Mesoamerican curve, five of these samples were plotted between A.D. 575 and A.D. 750; three clustered at points between A.D. 620 and A.D. 640 (see Appendix VII:Figure VII-1). The remaining two dates were aberrant.

Additional evidence for time of occupation is provided by burials that ranged from A.D. 980 to A.D. 1200 (see Appendix VI:VI-2). One of these dates, on Feature 654 (see Appendix IX:IX-13) might need to be corrected some 200 years downward (to around A.D. 1000) because of the C12/C13 ratio, which indicated consumption of maize by that individual. However, if A.D. 800 is retained as the maximum cut-off date for Baytown, all of these burials would have to post-date the Woodland occupation and, therefore, associated with what is considered Early Mississippian.

Relative dating through analysis of ceramics and lithics supports the radiocarbon assays and archaeomagnetic placements on a general level. First, there is the ceramic collection, in which over 80 percent of which is identified as Baytown Plain, var. Unspecified. Augmenting the plainwares are the second highest frequencies that include more than 1000 cordmarked sherds. Divided into six categories, defined by execution (see Appendix X), cordmarked ceramics comprise seven percent of data recovery collection. A minor incidence of incised, check-stamped, and certain punctated sherds have also been lumped under Baytown.

Mississippian ceramics are also identified at the site which produced a shell-tempered assemblage that comprises two percent of the entire collection. In addition, nine sherds were identified as brushed and one sherd was corn cob impressed; several of the punctated sherds are also considered Mississippian.

A second line of relative dating evidence is found in the lithic assemblage, which produced a rather unimpressive total of 12 projectile points (or point fragments). These were subsumed under a general biface class and subdivided on the basis of morphology, wear, and raw material as resembling diagnostics associated with Archaic or Woodland occupations (see Appendix X:X-31 ff). The Woodland types included several specimens closely reminiscent of the types Steuben, Bradley Spike, Flint River Spike and Tombigbee Stemmed (see Appendix X:X-42).

The collection also included Archaic projectile points that, unsupported by any comparative site data, only suggest an occupation during that time period. The points are clearly Archaic types and have been manufactured on a wide range of raw materials. For example, whereas Lafayette chert was the stone identified for the majority of lithics from 3CT50, Archaic projectile points were also produced on other cherts such as Pitkin, Dover and Boone (see Appendix X:Table X-6). However, we are not confident that the recovery of Archaic points should be equated with the presence of an earlier Archaic use of the site. Some of these types either co-occur in proveniences with later materials or were recovered from areas near often dense accumulations of Baytown ceramics.

Further, close examination of wear showed some retouch of Archaic points, a pattern that could be interpreted as re-use of the points during a subsequent occupation. If the points were re-sharpened and/or re-used during later periods (e.g., Late Woodland), the question then

remains as to whether the points were picked up elsewhere and brought to the site or recovered from the area encompassed by 3CT50. If the former is true, the Archaic points are not even relevant to an assessment of chronology at the site; however, if the latter is correct, the extensive activities and excavation of features associated with the Baytown habitation might have all but eradicated evidence of a pre-ceramic occupation.

The issue of whether these remains indicate a pre-ceramic component may be a moot point at 3CT50. Clearly, the principal occupation(s) is marked by remains assigned either to Baytown or Early Mississippian.

Ceramic Comparisons

In the assemblage that includes 14,714 Baytown Plain sherds (see Appendix X), less than two percent could be classified as fine sand-tempered and, therefore, might be more closely representative of Barnes phase ceramics.

An additional 110 sherds were independently placed in another type category distinguished in tables (see Appendix X) from Baytown Plain as a separate 'sand tempered' category. Grit temper, initially considered a possible indicator of late Baytown, was identified only in very minor frequencies.

In the definition of ceramic types presented in Appendix X, we have probably overstated the implications of Barnes pottery by emphasizing the co-occurrence of Barnes-like plainware with sherds that may be late in the Baytown period sequence. This co-occurrence was underscored by statements on the associated recovery of sand-tempered Barnes Plain, grit-tempered plain and Neeley's Ferry Plain, a type that is affiliated with Mississippian assemblages.

While the association of these ceramics was clearly evident at 3CT50, two facts must be weighted in evaluating what this association means. First, the incidence of sand-tempered (Barnes-like) and grit-tempered ceramics, as well as sherds identified as Neeley's Ferry Plain was incredibly low in comparison to those classified as Baytown phase pottery. Almost without exception, these ceramics appear as very low counts in proveniences dominated by Baytown Plain or Baytown phase examples of cordmarking. Perhaps more important is the incidence of non-association. Whereas the excavations did recover sand-tempered ceramics from proveniences that also yielded grit-tempered sherds and/or examples of Neeley's Ferry Plain, this "and/or" situation was more likely to be "or" than "and" in most instances.

For example, in Feature 351 we recorded 19 Neeley's Ferry Plain sherds and five sand-tempered ceramics; however, there were no sherds identified in the plain grit-tempered type. In this same feature, Baytown Plain comprised 83.5 percent of the collection. Conversely, Feature 685 yielded a ceramic inventory of 49 sherds, including one

example of plain grit-tempered and plain sand-tempered sherds. Forty of the ceramics (81.4 percent) in Feature 685 were classified as Baytown Plain.

The data from 3CT50 offer absolutely no firm evidence to infer temporal implications of sand-tempered sherds, most closely fitting the definition of Barnes Plain. Admittedly, if the co-occurrence of types was scrutinized excessively enough, some hint of a trend might be detected, but it is our opinion that the data would have to be painfully bent to make any sense of the trend. The fact is that the incidence of shell, grit and sand-tempered ceramics is so low and their distribution so unpatterned that it would be ludicrous to make temporal distinctions on the presence of a handful of minor ceramic categories.

This brief discussion of ceramic comparisons has not been intended as a step toward chronological refinements. Collections such as ours, relatively nondescript, appears to have been the prevailing characteristic of non-ceremonial Baytown and early Mississippian sites in general within the region. The unspecified super-type, Baytown Plain, reigns supreme and co-occurs with decorated Baytown wares, a grit-tempered Baytown Plain 'variety,' shell-tempered sherds classed as Neeley's Ferry Plain, and a low incidence of decorated ceramics typical of early Mississippian (e.g., brushed wares).

Baytown Plain was recovered from proveniences radiocarbon or archaeomag dated between A.D. 575 and A.D. 750, as well as dominating other proveniences dated by chronometric techniques to after A.D. 900. Types identified as Mississippian were, in some cases, absent from the A.D. 900 to A.D. 1200 proveniences. Even with this problem of apparent non-association and overlapping association, it seems obvious that the collection as a whole was remarkably static. The people who produced that pottery, and who lived at Little Cypress Bayou through the 600 years may simply have considered that their product was both functional and appropriate, and that it did not need changing.

Consequently, having established when the site was occupied, the focus is shifted to who lived there, what their living area looked like, and what they did at the site.

The Site Residents

Our primary line of evidence relative to the 'who' of Little Cypress Bayou occupation is derived from the bioarchaeological analysis of remains from four burials.[1] Burial 1 was a 30 to 35 year old

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[1]Rose et al. have a detailed discussion of the methods and parameters of bioarchaeological analysis, as well as site-specific and regional comparisons of the 3CT50 data. Presented as Appendix IV, Rose et al.'s report should be referenced for detail, as only a summary of findings is included in this discussion.

adult male whose remains were dated by radiocarbon analysis to A.D. 1030. Burials 2 and 2a were the remains of a 22 to 24 year old woman and seventh month in utero fetus, respectively; the radiocarbon assay on bone collagen, assumed to be the most appropriate to age Burial 2, was given by SMU as A.D. 980 (see Appendix VI). Burial 3 was a 12 year old individual dated to A.D. 1200; however, the age correction of 200 years (to around A.D. 1000) was suggested as necessary because of the -15.7 C12/C13 ratio on this juvenile. The fourth burial was evidenced by the fragmentary remains of an adult; analysis was less conclusive and no radiocarbon dates could be secured.

The radiocarbon assays on skeletal remains place the burials at the more recent end of the site's occupational continuum, but we are assuming these individuals to be representative of group composition. There was no evidence that any area had been set aside specifically for burial. Instead, the pits containing these individuals were distributed throughout the site and in proximity to different domestic areas, as evidenced by apparent structural patterns (e.g., Burial 3 lying to the southwest of Structure 1). The deceased seem, therefore, to have been members of the community at Little Cypress Bayou whose grave sites may have been deliberately selected near living areas with which they had been associated.

Investigation of pathologies showed mild osteophytosis on the male in Burial 1, a condition which Rose et al. (1985) feel argues for an activity pattern that produced severe back stress. The pregnant female in Burial 2 suffered from spina bifida, a condition that might have contributed to her early death during pregnancy; however, despite this pathology, the analysis of Burial 2a, the fetus, showed normal growth until the time of the mother's death.

The only other observable pathology in Burials 1, 2 and 3 was an episode of dietary stress at an early childhood age, indicated by hypoplasia; Burial 4 was too fragmentary to examine for this condition. No serious infectious pathologies were revealed by the individual remains, and the analysis produced no indications of iron deficiency among the population sample.

The occupants at Little Cypress Bayou did, however, exhibit some variance in diet. Examination of molars and wear patterns on the male in Burial 1 indicated a high consumption of hickory nuts, large amounts of minimally processed plant fibers and a coarse diet prepared with stone implements. In contrast, Burial 2 revealed a lower consumption of hickory nuts. Additionally, although a coarse diet prepared with stone implements is suggested, the Burial 2 individual differed from Burial 1 in the absence of molar polishing which suggests that her plant food had been either extensively processed or she did not consume plant fibers at all.

The evidence on the juvenile in Burial 3 is inconclusive. The molar microwear pattern on this child did not match that of the adults in Burials 1 and 2, thus Rose et al. (1985) could not make the

suggestion of hickory nut consumption in this case. However, a C12/C13 ratio of -15.7 did suggest the juvenile consumed a high quantity of maize, a finding in direct contradiction to the stable carbon isotope analysis results for the adult individuals.

There are variations within burial associations that might offer other evidence of group composition and, therefore, warrant some attention. As briefly noted, none of the individuals other than the juvenile in Burial 3 exhibited any indication of maize content. The juvenile also differs from the others in method of burial; this 12 year old individual was a primary extended burial, laid in a pit that contained four postholes that had clearly supported some superstructure above the pit. Figure 41 is a hypothetical reconstruction of what the structure might have resembled.

Likewise, fill from Burials 1 and 4 revealed little in the way of associated artifactual, floral or faunal remains. Burial 2, however, is a dramatic exception. The pregnant female and her fetus were interred in a pit that contained 62 ceramics and was replete with faunal remains; these remains represented an extremely broad variety of species. The only other item recovered from the fill was a single sumac seed.

The quantity of ceramics, combined with the substantial and varied faunal collection in this pit contrasts rather sharply with data recovered from the other three burials. Whether the faunal associations were purposefully interred with the woman as some kind of ritual (e.g., providing food in an afterlife for her and the child) or incidental inclusions is unknown, but the finding should be considered in any subsequent study. Also, Bogan (this report, Volume II) documented the presence of snails which suggested to him that the grave had been left open for some time and/or included some kind of wooden covering. Again, this could indicate special treatment.

Assuming these four individuals to be representative of the population at Little Cypress Bayou, we can draw several conclusions regarding group composition.

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1. The site was inhabited by adult men and women, and children.

2. Diet seems to have been adequate for nutrition as evidenced by

    a. adequate iron intake,
    b. lack of infectious pathology,
    c. basically normal pregnancy to seven months in a woman suffering from spina bifida.

3. That some variation was evident in the diet which might be related to adaptive shifts, status, preference and/or custom is suggested by

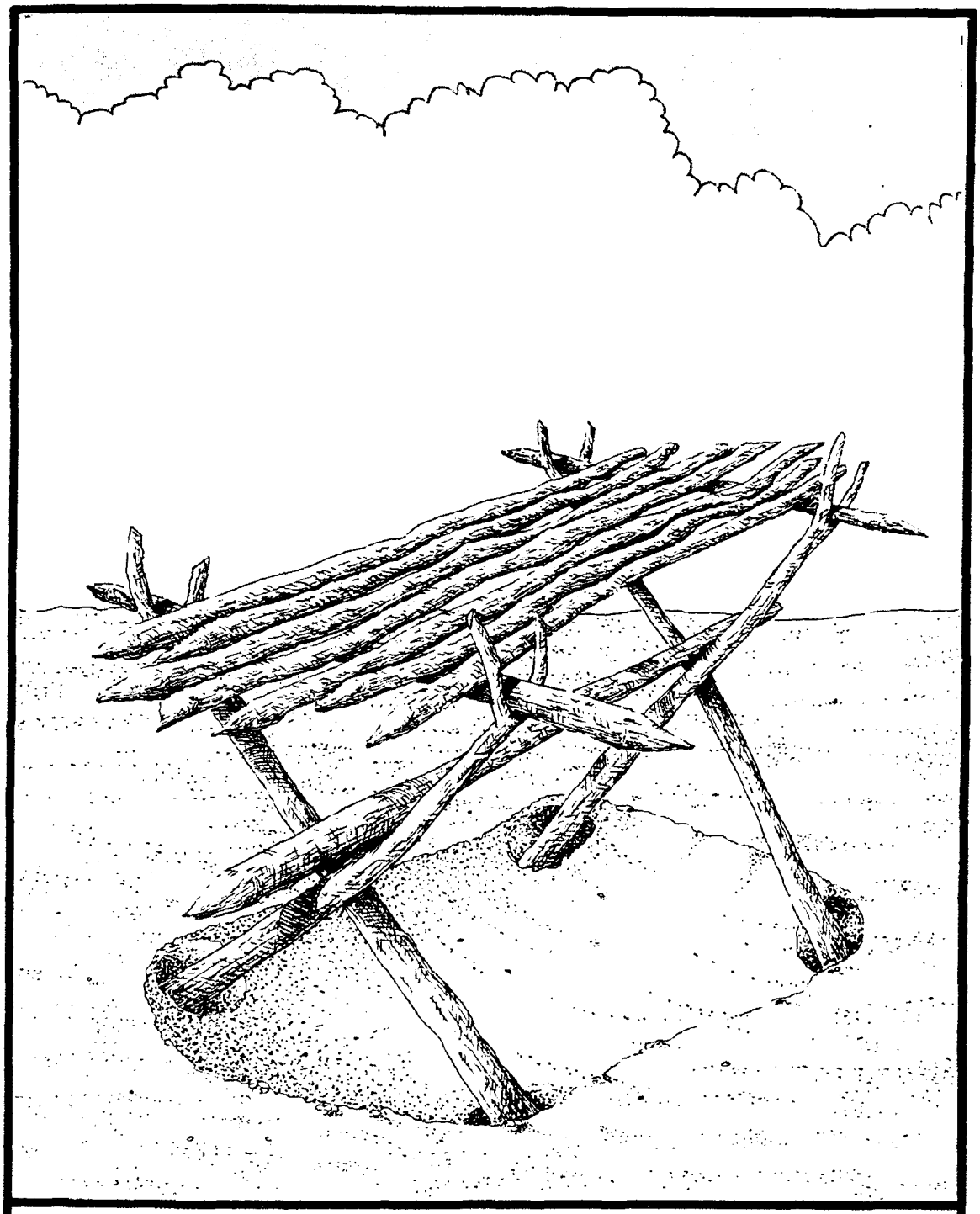

FIGURE 41. HYPOTHETICAL RECONSTRUCTION OF THE BURIAL STRUCTURE ASSOCIATED WITH BURIAL 3.

a. generally low to moderate consumption of carbohydrates in Burials 1 and 2,
b. high maize content of the juvenile in Burial 3,
c. coarse diet prepared with stone implements, and
e. variable processing of fibrous plants.

4. Some dietary shifts may have been taking place as evidenced by the consumption of maize in Burial 3 and episodes of dietary stress in Burials 1, 2, and 3 at an early childhood age.

5. The group seemed to function in peaceful and supportive way as revealed by

   a. no evidence of violent deaths,
   b. no evidence of violent episodes prior to death in the individual remains,
   c. general adequacy of diet,
   d. acceptance of community members handicapped by disease (e.g., woman with spina bifida), and
   e. unextraordinary, but normal care afforded in burial of the dead near domestic areas.

Community Lay-Out

The Phase I and II stripping operations, encompassing roughly 600 sq m revealed 331 cultural features distributed over Blocks 1 and 2. Considering the ratio of features to total area exposed, this is only .55 features per square meter; however, the figures are deceptive. Only the northern portions of these two blocks were on the upper slopes of the relict levee and it was in this combined area of approximately 350 sq m that most of the features were concentrated. The lower levee slopes begin somewhere around the N170 grid line (see Figure 25) where the density of features drops dramatically till there are none at all present at the base.

Consequently, within the major concentration area, feature density is actually slightly more than one feature per one meter square. Had we been able to examine patterns in the some 60 sq m area between the blocks where a farm road had disturbed remains, we expect that another 60-odd features would have been found. We also suggest that total number of features actually present at the site is probably at least double the amount observed in Blocks 1 and 2 and that estimated as disturbed by the farm road, because the levee crest was outside the ROW.

Even without extrapolating to unexcavated areas, the sheer density of features suggests intensive use of the site area by its prehistoric occupants. Within the worked area, there are 193 postholes, 60 baked clay pits (Categories 2 and 3), four burials and 74 pits or trenches

of varying size and configuration. Although there are no definitive patterns, many of the postholes are aligned in such a way as to outline six possible structures that are distributed throughout different parts of Blocks 1 and 2. Structures 1, 3, and 7 seem to form enclosed areas that would have been suitable for dwelling; Structures 4 and 5 also look as if they represented enclosed patterns before being truncated by the farm road and disturbed by erosion. Outlined by 14 posts, the sixth pattern, Structure 6, is more problematic because nine of the posts cluster in a tight arc on one end, while the other five are so widely spaced there is only the irregular hint of an oval form.

While some of the six patterns may be somewhat tentative, we still feel confident in concluding that there were structures erected at the site. With an actual or reconstructed size of between 25 sq m and 35 sq m, all of these structures would have provided ample living space for a nuclear or extended nuclear family.

In addition to structures, the variety of pits at the site suggest that cooking, storage, disposal and preparation activities, like preparing hides and preserving foods for later consumption (e.g., smoking meat), were conducted. Moreover, and as also described in Chapter Four, some of the features appear to cluster in linear-type arrangements that appear to imply deliberate placement for functional considerations.

With the cultural implications associated with archaeologically defined periods like Baytown and early Mississippian still ignored for the moment, we admit to being struck by the symmetry reflected in this composite picture of the Little Cypress Bayou site. The patterns delimited as possible domestic structures are an average of about five meters distant from one another. The ten feature clusters, distinguished partially because of the seeming regularity to their linear arrangement, are also rather evenly distributed across the excavated site area in apparent association with various of the structures.

Finally, there is apparent patterning to the placement of the burials in relation to structures: Burial 1 (Feature 658) lies to the northwest and just outside what we have defined as Structure 5; Burial 2 (Feature 905) is southeast of Structures 3/7; Burial 3 (Feature 654) is to the southwest of Structure 1; and, the badly disturbed Burial 4 lies to the northwest of Structure 6.

This patterning is supported by the occurrence of isolated fragments of human bone that were identified during the faunal analysis but not given burial designations. Feature 330 was an 85 cm by 57 cm shallow basin (Category 4) that produced a human molar and was situated on the southwest exterior of Structures 3/7. Feature 433, immediately northwest of Structures 3/7, was a 52 cm by 39 cm baked clay pit (Category 2) that yielded a human tooth. The other human remains identified were from a shallow basin (Feature 413) and midden

remnant (Feature 414) at the extreme northern edge of Block 1, about seven or eight meters northwest of Structure 5.

Site Activities

The kinds of activities conducted at Little Cypress Bayou are variably evidenced by 1) technology, 2) subsistence, and 3) status.

Technology

The level of technology and effort devoted to the production of material items are apparent from artifact collections that, in our opinion, reinforce both a functional and seasonal occupation at the site. The analysis of Burials 1 and 2 indicated a coarse diet prepared by stone implements, that, insofar as the lithics reveal, were manufactured primarily: 1) as a chipped stone industry; 2) on locally available Lafayette chert; 3) as immediate need items from raw materials on hand or as retouched/reworked items on hand; and 4) as groundstone tools that continued to be used until exhausted or otherwise no longer functional (see Appendix X for detail on lithic categories).

The low incidence of primary and secondary flakes, which are unpatterned in their distribution across the site, suggest these people were mostly using, rather than producing the chipped stone implements. And, the analysis of other lithic categories indicates the occupants were using stone effectively as well as to maximum extent, two factors that seem to point to activities associated with sustaining households within the community at large. There is evidence of retouch and reworking on flake debitage and also, as noted previously, on several Archaic points; some of these points were in association with later chronological markers.

While it might be inferred from the chipped stone assemblage that the occupants had to maximize their use of stone because of a limited resource supply, this does not seem to have been the case. Rather, the collection appears to reflect a level of technology well suited to multi-purpose use with, perhaps, some value consideration being placed on items that were not easily accessible within the site area. For example, most of the cores were identified as Lafayette chert, locally available on Crowley's Ridge; several of these appear to have been thrown away before they were exhausted. In contrast, evidence of exotic cherts was infrequent and more value might have been placed on their use as evidenced by Ozark Escarpment cores, all of which (one Boone chert, two Jefferson City dolomite and one Penter chert) were completely exhausted before discard.

Likewise, groundstone tools appear to have been discarded only after exhaustion or if they were too fragmentary to use. Overall, however, groundstone was also characterized by its relative sparsity, a fact that might indicate curation of these tools when the occupants left. On-site curation may also be inferred from Feature 625, which

contained five tools, including cores, a projectile point, preform and biface, and a small quantity of flakes; other than a few pieces of fired clay, this pit contained no ceramics or any faunal or floral remains. In this case, the presence of tools and the absence of other material/subsistence remains suggested it might have been a place where lithics were cached for later use when occupants returned to the site.

Thus, the lithics form an assemblage in which the practicality of the items is emphasized over production. There is no indication of ceremonial items or special purpose tools whose use was limited to certain activities, nor is there any suggestion of a specialized industry such as the manufacture of blades. Edge analysis revealed some variation in the probable use of lithics, such as selected items being employed for 'soft processing' as would be expected in hide preparation, while others fell more in a realm of generalized cutting and scraping. But, overall, the collection suggests use by a group who came to Little Cypress Bayou for activities unassociated with tool manufacture; who utilized locally available raw materials; who discarded items made on non-local raw material and groundstone only when their usefulness as implements was exhausted; and who cached a few items for recovery and use on subsequent visits.

The basic utilitarian level of technology is reinforced by the fact that over 85 percent of the more than 17,000 sherds consisted of plain ceramics, most of which are typed as grog or grog/sand tempered Baytown Plain. The occurrence of sand, grit and shell tempering agents was observed, but less evident in the collection as a whole.

Surface treatment, through decoration or other deliberate manufacturing techniques, seems not to have been a primary concern of the potters at this site, or at least as far as they were concerned with the type of pottery used at the site. Only 1737 sherds (10.2 percent) in the collection were decorated and 60 percent of these fell into one of the cord-marked categories. Minor incidences of incising, punctating, check-stamping (eroded), rocker stamping, impressing, and brushing were observed, but clearly in almost inconsequential frequencies.

Overall, the ceramic manufacture reflects a concern with effective use rather than style or show. To the very limited extent we are able to determine, vessel forms display broad similarity in the collection, mostly represented by bowls and jars without evidence of elaborate or special purpose shapes; and, like rims in general, modified rims (e.g., pinched, scalloped) were nearly absent. Even when the ceramics were viewed in terms of different tempering agents, the collection displayed relative uniformity in form and attention to treatment only to the extent that utility is ensured; the inclusion of grit in the clay matrix was segregated as possibly representing a 'type,' not in the classic temporal or cultural sense, but rather as a strengthening agent--again, usefulness (see Appendix X:15-16).

The only other example of material technology at Little Cypress Bayou is worked bone, the majority of which is deer antler (Appendix X:74). There were no items that could be even weakly construed as ornaments and none of the material collection included pieces that might have been produced for ceremonial or purely decorative purposes (e.g., figurines).

Subsistence

The evidence for subsistence at Little Cypress Bayou is appreciable and, in combination, the floral specimens, faunal remains and phytolith studies suggest an efficient pattern of hunting, fishing, and gathering that was augmented by limited and, probably, incipient, horticulture. Summarized as such, we feel the subsistence data also reflect a high level of efficiency in exploiting the site environment, which microfossil analysis indicates was a "mixed deciduous forest and cypress swamp" at the time of occupation (Appendix V:V-11). The presence of some pine on favorable soils within the Mississippi River floodplain was incongruous, but, overall the environment was typical of late Holocene floodplain vegetation.

The faunal collection is appreciable in quantity and variety, but generally indicates a total reliance on resources[2] available in and near the floodplain environment (see Appendix II for detail). Hunting activities focussed on white-tailed deer, squirrel, and other small mammal, as well as rodents and not an inconsequential quantity of snake. Fishing was likely as important a subsistence activity as hunting given the sheer quantity of fish remains; among the most prevalent of identifiable remains are catfish, bowfin and drum. Remains of alligator gar and suckers, like carp and buffalo, are, however, conspicuous by their absence in the 3CT50 collection.

Also conspicuous by their extremely low frequencies are water fowl, particularly migratory species that might indicate the occupants were settling at Little Cypress Bayou to take advantage of fly-ways during either the spring or fall. A few examples of duck and goose were identified, but overall, even examples of year-round populations like turkey and hawk were very few in number. The conclusion that these inhabitants were less concerned with birds than mammals or fish is not, in our opinion, a reflection of different preservation or identification of remains; the amount of unidentifiable bird bone pales in comparison with any of the other faunal categories.

Besides identifying the targets of hunting and fishing, the faunal collection is interesting in other aspects. First there is the distribution of remains. White-tailed deer was recovered from more than 25 features around the site, whereas squirrel was found in more than 30, snake in more than a dozen and fish in more than 100;

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[2]This discussion uses only common names; scientific names can be found in Appendix II.

however, there are a number of features that stand out because they are either dominated by or include only aquatic species, and there are others distinguished by the low incidence of aquatic remains, but presence of mammals. This latter category is further distinguished by the frequent co-occurrence of deer, squirrel and/or snake in a near absence of any fish remains.

We have no real conclusions on the distribution of faunal remains in relation to one another, but certain trends seem worthwhile to discuss. For example, Feature 294 is a Category 2 (round/oval) baked clay pit in which the only identifiable remains were aquatic species (several unidentified bird and mammal bones were included); adjacent to that pit was a Category 3 (square/rectangular) baked clay pit in which fish remains were low, but mammals, including squirrel and white-tailed deer, were plentiful. This type of situation tends to be repeated at the site; however, none of the patterns seem to reflect a preference for any one area. Further, there is no sound indication that the pits dominated by fish or other aquatic resources (e.g., turtle) contain material remains appreciably different than those dominated by mammals. The most obvious, but yet unproven, explanation would be that the occupants cooked fish in different ways and, thus, in different pits, than they did mammals.

A second aspect of the faunal remains is again related to distribution, but in terms of inference about the relative dietary importance of species. With no affront to the value of MNI (minimum number of individual) studies intended, the remains of certain faunal species like white-tailed deer might be taken to reflect far less reliance on this mammal than was actually the case if only bones were used to account for individuals. We feel this is an especially important consideration when only a portion of the actual site has been investigated.

Using the white-tailed deer as an example, the distributed of remains across the site exhibits a paucity of meat bones (Bogan, this report, Volume II). It almost appears as if some of the deer were being dressed away from the site area, with the meat, but not the major bones, being returned to 3CT50.

It seems clear from the deer example that the remains present in features at the site are only a small portion of what was actually acquired. And, further, the distribution of these remains indicates processing throughout the site area and, thus, association with several households.

Related to this issue is the matter of maximum utility. Bogan (Appendix II) observed that the remains of some faunal species (e.g., squirrel) lead him to conclude the bones might have been crushed for stew or broth. It appears that the smaller mammals were being fully processed, and even their bones pounded and boiled, a conclusion that might be supported by the utilitarian function of so many ceramics at the site.

The third aspect of faunal interpretation relates to seasonality and selective reliance. The dominant fish remains are very small catfish, bowfin and drum, all of which swarm in late May through early July. Suckers, like carp, are available most of the time in such an environment, but were not exploited. Also, any modern fisherman in areas like 3CT50 knows that alligator gar can be reeled in more frequently than desired, yet remains of this fish were sparse. From these data we can infer the population at Little Cypress Bayou was not in want of food, but were able to exert some preference in resource exploitation. Instead of taking any fish caught, the occupants seem to have been selecting for those which were most tasty, even if the size was small and the quantity had to be larger.

Another consideration is technique. The disproportionate quantity of small catfish, drum and bowfin might represent an indiscriminant net catch. If seine-like nets were being used to catch fish, there may have been less concern with selection than with the quantity recovered through the least effort.

Taken as a whole, the faunal collection indicates these inhabitants seem to have had a clear idea what resources would be available to sustain life on the levee, when they would be available, and how they could be most obtained in the most cost/efficient way. Comparing frequencies of small fish like catfish, bowfin, and drum, with white-tailed deer and squirrel, and the absence of migratory fowl, the optimum period of habitation seems to be very late spring, summer and early fall.

The floral resources support this conclusion. Wild bean was recovered from 17 features, the pods and seeds of which are available from summer through autumn (Fernald and Kinsey 1943). One seed of blackberry, available as a fruit from June through July, was recovered. Four fragments of seedheads, which ripen from July through November, were recovered from four features. Four whole and nine seed fragments of grape were recovered from 11 features and include summer, sweet winter, red, river bank, sand, and muscadine or Scuppernong grapes, all edible and available from August through December. Also present are grasses (Poaceae), available from June through December, and the fruits of the hawthorn, which ripen from August through October.

Honey locust, present in quantity and used as a beverage or sweetener (Fernald and Kinsey 1943), is a bottomland species, the fruit of which ripens in September and October. Persimmon was found in 43 features; its' fruit ripens after the first frost, usually in November, and will remain available through the winter.

The nut remains underscore a conclusion that the population living at Little Cypress Bayou was doing so between early summer and late fall. Hickory, represented by over 5257 shell or meat fragments, was available as following [all habitat information is taken from Fowells 1965:111-138]:

Thick-shelled species

C. tomentosa (mockernut) - grows on ridges and hillsides

C. glabra (pignut) - inhabits dry ridges and hillsides

C. ovata (shagbark) - grows in deep, moist alluvial soils, principally river bottoms

C. laciniosa (shellbark) - a bottomland species, grows on river terraces and loamy flats

Thin-shelled species

C. cordiformis (bitternut) - bottomland species

C. aquatica (water hickory) - grows well in alluvium-like soils, also on poorly drained heavy clay flats

Most of the fragments recovered are thick-shelled; only seven thin-shelled fragments (not classed as pecan) were identified in the quantified sample and these could not be classed as to species. As is well-known, hickory nuts were an important food source among American Indians, and hickory wood was used extensively. The nuts ripen and can be harvested between September and December; however, accounts of early explorers (Swanton 1946) suggest that hickory nuts, and other nutmeats were stored, and used later in the winter months (February to April) when supplies of other foodstuffs were low.

Pecan shell was recovered from 32 features; the features also yielded the remains of other nut foods. Somewhat surprisingly, pecan represented only 1.1 percent of the possible food remains recovered; its low incidence in the 3CT50 deposits is not completely understood, as the pecan tree is common in the area and grows well in river-bottom soils. Also included in the collection were walnut shell (2.2. percent) and red and white oak (8.1. percent).

Possible domesticates include sunflower, sumpweed, maygrass, chenopod, and smartweed. True domesticates are represented by maize, squash, gourd, and bean (see Appendix III). Examination of microfossils supports the floral analysis. As Fredlund and Bozarth state (Appendix V) there is "evidence for the cultivation of both corn (Zea maize) and squash (Cucurbita sp.) [however, the] evidence for cucurbits seems the stronger of the two."

The presence of domesticates, particularly maize, is generally weak for that portion of the site NWR investigated. Excluding the small phytolith sample, 16 features are listed as having produced maize (see Appendix III:III-20), but positive identification of kernal and cupule fragments was made for only five. One of the five

(Feature 782) is of questionable integrity. Three others were postholes (Features 31, 745 and 837) that together produced eight Baytown sherds. The fifth feature (769; considered Structure 8) is interesting because it is a Category 9 trench/trench-like pit that contained three postholes and yielded five fragments and one whole kernal of maize. Of the four features in Category 9, this one was the most aberrant and was separated as a probable wall trench.

Six ceramics were recovered from the feature fill; four are Baytown types, one is a plain, grit-tempered sherd and the sixth is a sand and shell tempered sherd typed as Neeley's Ferry Plain. Although we have no radiocarbon dates on this pit, Feature 769 stands out as the most Mississippian-like deposit excavated at the site.

In the context of a Mississippian affiliation, the recovery of maize is nothing extraordinary; however, judging from the paucity of domesticates, most of the occupants living in areas we examined do not appear to have been seriously engaged in horticultural activity. It is probably safe to assume a practice of maize (as well as squash and bean) horticulture, but the real question is two-fold: 1) to what extent was it practiced; and 2) by whom. Domesticates, including maize, were recovered from contexts that produced only Baytown ceramics as well as some proveniences without any ceramics or, for that matter, artifacts of any kind. And, as with Feature 769, where domesticates were associated with Mississippian diagnostics, the fill was more often than not dominated by Baytown remains.

In sum, the occurrence of maize and other domesticates, even in very small quantities, confirms at least limited horticulture. And the association of domesticates with features that contain only Baytown materials as well as those with shell-tempered ceramics suggests some horticulture was pursued in the Late Woodland/Early Mississippian periods. Further, the high content of maize indicated by the C12/C13 ratio on the juvenile in Burial 3 attests to the fact that someone at the site was also eating maize. But, not everyone; the other two burials (1 and 2) on which stable carbon isotope analysis was conducted produced no evidence of maize consumption at all.

Finally, the fact that the juvenile exhibited an anamolous micromolar pattern notwithstanding, none of the individuals buried at 3CT50 displayed any iron deficiency and Rose et al. concluded that a nutritionally adequate diet was provided for each of these people. Consequently, we have to infer that the data offer no evidence of maize dependency and, for the majority of the populace at Little Cypress Bayou, a reliance upon hunted or gathered resources is suggested.

Status

By status, we are referring to any evidence of class distinctions at the site. There are only two cases where status might be inferred; the first is with Burial 3, on whom the preceding discussion was

focused. Rose et al. (see Appendix IV) were intrigued by not only the high maize content and anamolous molar pattern of this adolescent, but the manner in which he was buried which suggested meticulous preparation. The erection of some sort of burial platform or superstructure is disparate from the other three interments, and it appears that the burial was afforded some degree of special treatment.

Such care, however, does not seem to be implied by associated grave offerings. As already noted, the fill from Burial 3 contained only sparse quantities of floral and faunal items, as well as fragments of material items; in general, the impression of status is not solely supported by all avenues of data.

The second case where special treatment might imply status differences is with the pregnant female and fetus in Burial 2. Rose et al. (see Appendix IV) have observed that what appeared to be no consumption of plant fibers (or consumption only of fully processed plants) might have been related to pregnancy taboos. The extensive quantity and array of faunal remains led Bogan (Appendix II) to a similar conclusion about her burial pit; the sheer quantity of faunal remains may have implied purposeful inclusion, to support the mother and child.

Other than these two examples, the type and distribution of both material and subsistence remains give no indication that any particular part of the site served a special status function or was occupied by high status individuals. The ceramic collection can be accurately characterized in one word, utilitarian. And 'functional' is probably the best descriptor to apply to the lithic collection.

Worked bone comprised the only other evidence of material technology. The recovery, from various features, of worked antler and antler bases confirms that the occupants were engaged in the production, as well as use of bone tools. However, despite the low incidence of rib and other meat bones, the collection produced no evidence of bone ornaments and there were no concentrations of bone that might have been associated with an industry focused on bone modification.

Thus, from a technological standpoint, the material collection displays nothing from which status differences could be inferred. Nor is there any indication of artisans that might have constituted a class with certain status privileges.

Finally, the subsistence data provide only marginal data concerning possible status differentiation. We do acknowledge the possibility that access to maize may have been restricted at some point in time and, therefore, represents one possible example of status. Likewise, the suggestion that faunal remains were deliberately interred with Burial 2 might also reflect some variation in status either because of pregnancy, death during pregnancy, the spina bifida or any combination of these factors.

Summary

This overall assessment of status as well as the preceding sections has to be qualified by a reminder that NWR's excavations were confined to the Corps ROW. Thus, the corpus of data from which inferences can be drawn are only part of the reality that was prehistoric occupation at Little Cypress Bayou. Because of the problems outlined at the outset of this discussion, we cannot place all the parts of the site into either Baytown or early Mississippian. The chronological implications of the site are unresolved except on the most general level. Little Cypress Bayou was what we have described in the preceding sections. It was a place selected for occupation between A.D. 575 and A.D. 1200; we do not know how often it was occupied, how many different groups are represented by the occupations, or how continuous' or sporadic the occupation was beyond the seasonal implications.

And, to view the occupation as altering through time, we would have to badly manipulate what data are available. Obviously, there were changes through time; yet, again and again we were struck by the consistency in the collections as a whole. The comprehensive portrait of Little Cypress Bayou reveals a basically rural, egalitarian and culturally conservative community. There were no doubt differences among contemporaneous occupants of the community, but the structure of that community overall is rather homogenous.

The subtle differences which mark differentiation on the community level have been masked through time. In the case of Little Cypress Bayou, the differences are hard to see and even more difficult to demonstrate. With the continued ambiguity of plain ceramics, we would have to get an absolute date on every feature possible to place this site in dynamic context.

With the evidence at hand, however, even a dynamic view might not reveal differences. The basic structure of life seemed to continue with new ideas and other products of what can probably be called prehistoric progress accepted into the community on a gradual, perhaps frugally cautious way. The events that transpired to create a classic Mississippian culture out of a Late Woodland society were probably as important to the people living at Little Cypress Bayou at that time as they are expressed as critical research issues in academic treatises and CRM reports. Whether the people at Little Cypress Bayou ever had anything directly to do with those events or were even immediately and visibly affected by them seems doubtful.

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